

WATKINS MILL AND TRAVIS ROAD STREAM RESTORATION PROJECT

TABLE OF CONTENTS

CATEGORY 000 – GENERAL REQUIREMENTS, REFERENCES, AND SPECIFICATIONS

- A. SUMMARY DESCRIPTION OF WORK
- B. REFERENCED STANDARDS AND SPECIFICATIONS
- C. SPECIFICATIONS/SCOPE OF WORK

CATEGORY 100 – PRELIMINARY (MSHA-BASED)

SECTIONS:

- 101 CLEARING AND GRUBBING
- 104 MAINTENANCE OF TRAFFIC
- 107 CONSTRUCTION STAKEOUT & AS-BUILTS
- 108 MOBILIZATION/DE-MOBILIZATION
- 120 TREE PRESERVATION
- 100 ORANGE CONSTRUCTION FENCE

CATEGORY 200 – GRADING (MSHA-BASED)

SECTIONS:

- 202 CHANNEL OR STREAM CHANGE EXCAVATION (CLASS 5)
- 200 SUBSOIL (SALVAGED AND FURNISHED)
- 200 CHANNEL BED MATERIAL
- 200 SAND AND GRAVEL (SALVAGED AND FURNISHED)

CATEGORY 300 – DRAINAGE (MSHA-BASED)

SECTIONS:

- 308 EROSION AND SEDIMENT CONTROL
- 300 FLOODPLAIN BOULDER TOE PROTECTION
- 300 CHANNEL BOULDER TOE PROTECTION
- 300 TOE WOOD
- 300 BOULDER CASCADE
- 300 ROCK STEP
- 300 FLOODPLAIN GRADE CONTROL LOG STRUCTURES
- 300 CLAY CHANNEL BLOCK

CATEGORY 400 – STRUCTURES

SECTIONS:

- 405 REMOVAL OF EXISTING FOOTBRIDGES

CATEGORY 500 – PAVING

SECTIONS

- 504 HOT MIX ASPHALT PAVEMENT
- 508 MILLING EXISTING HOT MIX ASPHALT PAVEMENT

## WATKINS MILL AND TRAVIS ROAD STREAM RESTORATION PROJECT

### CATEGORY 700 – LANDSCAPING (MSHA-BASED)

#### SECTIONS:

- 701 TOPSOIL AND SUBSOIL
- 704 TEMPORARY SEEDING AND TEMPORARY MULCHING
- 707 PERMANENT SEEDING
- 700 FLOODPLAIN MATTING (COIR 1000 OR SIMILAR)
- 709 SOIL STABILIZATION MATTING
- 710 TREE, SHRUB, AND PERENNIAL PLANTING

### CATEGORY 800 – TRAFFIC (MSHA-BASED)

#### SECTIONS:

- 813 FABRICATION AND INSTALLATION OF 4' X 8' ALUMINUM SIGN

## CATEGORY 000 – GENERAL REQUIREMENTS, REFERENCES, AND SPECIFICATIONS

### **A. SUMMARY DESCRIPTION OF WORK**

The City of Gaithersburg intends to enter into a Unit Price Contract with a qualified firm to provide construction and construction-related services for the restoration of Whetstone Run and Watkins Mill Run in Gaithersburg, Maryland. All work will take place on property owned by the City or on property where the Land Owner is allowing the City to make necessary repairs to the stream and adjacent floodplain.

The proposed project includes approximately 2,400 linear feet of stream across three stream segments of Whetstone Run, Watkins Mill Run, and an unnamed tributary to Whetstone Run. The project area is located in Montgomery County, Maryland, within the Gaithersburg city limits. Stream restoration work activities will consist of but are not limited to excavation and fine grading, furnishing and installing rock and log structures, furnishing and installing landscape seed, plant materials, and stabilization matting, and restoring and stabilizing all disturbed areas. The project will require the implementation of a traffic control plan for construction activities along Watkins Mill Road.

This unit price contract will allow the City to perform this project according to its design, but also allows for variations in field conditions at the time of construction, and the ability to address these changes in a timely, responsive manner. Work will be performed in coordination and/ or at the direction of the Engineer or Engineer's Technical Representative (ETR) with a fully permitted design. All work will involve the technical oversight of the City and its technical representatives and the contractual oversight of the City.

Where applicable, specifications shall apply in the following order of preference:

- 1) A specification provided in these Contract Documents.
- 2) A Montgomery County Department of Transportation Standard specification or detail.
- 3) The most recent version of the Maryland State Highway Administration's Standard Specifications for Construction and Materials.

Special concern must be given to sediment control issues, due to the close proximity of the receiving streams. Stream restrictions dates must be honored, and all work performed with all local, State, and Federal applicable regulations and project permits. Trees and wildlife must be protected and conserved in the process of the work. Handling of stormwater flows through the work areas must be considered. Pumping around the work areas must mitigate any sediment release. The streams within the project area (Watkins Mill Run and Whetstone Run) are classified as Stream Use I. Therefore, no in-stream work shall be performed during the stream closure period of March 1 through June 15.

The Contractor must provide the Work in accordance with all permits provided by the City of Gaithersburg (Owner) for the Projects in the Contract; the permits are part of the Contract Documents. The Contractor must obtain, and provide the Work in accordance with, all other permits required by law as necessary to complete the Work. The Contractor must schedule all required meetings and inspections with, and obtain required approvals from, the Regulatory Agencies administering each permit. **Specifically, the Contractor must obtain required approval signatures, as the inspections are completed, and on any Construction Inspection Check-off List provided in the Contract Documents.** See Section 308 for additional Contractor responsibilities related to the Erosion and Sediment Control permit.

The Contractor will ensure the quality of work by employing qualified, experienced personnel, trained in environmental restoration and sediment control measures. Contractor will provide all necessary

management, supervision, personnel, labor, tools, materials, and equipment for each of the Unit Prices bid. This is the means of payment, and is intended to be the price inclusive of all Contractor costs.

## **B. REFERENCED STANDARDS AND SPECIFICATIONS**

The following specifications and standards, including addenda, amendments and errata, form a part of this specification to the extent required by the references thereto. The Contractor must adhere to any newer versions of the referenced standards and specifications. The list below is the most frequently used standards that are referenced but other references may be referenced in the standard specifications.

American Association of State Highway and Transportation Officials (AASHTO). Washington D.C. <<http://www.transportation.org/>>. Referenced as "AASHTO".

American Concrete Institute (ACI), Farmington Hills, Michigan. <<http://www.concrete.org/general/home.asp>>. Referenced as "ACI".

- ACI-318-11 – "Building Code Requirements for Reinforced Concrete".
- ACI-350-06 – "Code Requirements for Environmental Engineering Concrete Structures and Commentary".
- ACI SP-66-04 – "ACI Detailing Manual". This standard replaced ACI 315-92.

American National Standards Institute (ANSI), Washington D.C.

- A300 – "American National Standard for Pruning", 2008.
- Z60.1 – "American Standard for Nursery Stock", 2004.

American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF), "Standard Methods for the Examination of Water and Wastewater". Washington D.C. 2012, 22nd Edition. <<http://www.standardmethods.org/>>. Referenced as "Standard Methods for the Examination of Water and Wastewater".

American Society of Testing and Materials International, Standards Worldwide. West Conshohocken, PA. <<http://www.astm.org/Standard/index.shtml>>, Referenced as "ASTM".

Concrete Reinforcing Steel Institute (CRSI). Schaumburg, Illinois. <<http://www.crsi.org/>>. Referenced as "CRSI"

- CRSI "Manual of Standard Practice 2009", 28th edition.
- CRSI "Placing Reinforcing Bars 2011", 9th edition,

International Code Council (ICC), International Building Code (IBC) as adopted by the City of Gaithersburg. Washington D.C. <<http://www.iccsafe.org/>>. Referenced as "International Building Code"

Maryland Department of the Environment (MDE), Water Management Administration in association with Soil Conservation Service and State Soil Conservation Committee, "2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control". Baltimore, Maryland. 2011. Referenced as "MDE Specifications for Soil Erosion and Sediment Control".

Maryland Department of Environment, Water Resources Administration, "Maryland's Guidelines to Waterway Construction", Baltimore, Maryland. November 2000 revision. Referenced as "MDE Construction Guidelines".

Maryland Department of Transportation (MDOT), State Highway Administration (MSHA), Hanover, Maryland. <<http://www.roads.maryland.gov/home.aspx>>. As revised on MSHA website. Referenced as “MSHA”.

- “Book of Standards for Highway and Incidental Structures”. Referenced as “MSHA Standard Details”.
- “Standard Specifications for Construction and Materials”, April, 2017. Referenced as “MSHA Standard Specifications” or “MSHA”.

Montgomery County Department of Transportation (MCDOT), Rockville, Maryland.

- “Design Standards”; <<http://www2.montgomerycountymd.gov/DOT-DTE/Common/Standards.aspx>>
- “Montgomery County Road Code” , 2008.
- “Work Zone Traffic Control Standards (MCWZTCS)”, July 2008.

The City of Gaithersburg Code, Section 15-8, Disturbing the Peace, Regarding Noise Control.

National Asphalt Pavement Association (NAPA), Lanham, Maryland.

<<http://www.asphaltpavement.org/>>.

- “Design, Construction and Maintenance Guide for Porous Asphalt Pavements for Stormwater Management,” Information Series No. 131, 2008.
- “Design, Construction, and Maintenance of Open-Graded Friction Courses”, Information Series 115, 2002.

NSF International, “NSF/ANSI Standard 61-2012” (NSF 61). Ann Arbor, Michigan.

<<http://www.nsf.org/>>.

United States Department of Agriculture, Natural Resources Conservation Service (NRCS), Maryland, “Conservation Practice Standard, Pond, Code 378”, January 2000. Washington D.C. Referenced as “NRCS MD-378”.

United States Department of Agriculture (USDA), United States Composting Council (USCC),

“Test Methods for the Examination of Composting and Composts (TMECC)”. Washington D.C. 2002.

United States Department of Justice (USDJ), American Disabilities Act (ADA), “ADA Standards for Accessible Design”. Washington D.C. 2010. <<http://www.ada.gov/>>

United States General Services Administration, “Index of Federal Specifications, Standards and Commercial Item Descriptions (FMR 102-27)”. Washington D.C.

<<http://apps.fas.gsa.gov/pub/fedspecs/>>. Referenced as “Federal Specifications”

United States Occupational Safety and Health Administration (OSHA), “Confined Spaces Standard, 2004”. Washington D.C. <<http://www.osha.gov>>.

Washington Suburban Sanitary Commission (WSSC). Laurel, Maryland. <http://www.wsscwater.com/>

- “General Conditions and Standard Specifications”, 2012. Referenced as “WSSC General Conditions and Standard Specifications”.
- “Standard Details for Construction”, 2016. Referenced as “WSSC Standard Details”.

REMAINDER OF PAGE INTENTIONALLY LEFT BLANK

**C. SUMMARY OF REQUIRED MATERIAL AND SUBMITTALS/CERTIFICATIONS:**

1. The Contractor will be responsible for completing all submittals in accordance with the terms and conditions of the contract documents. The submittals required for Work under this Contract include, but may not be limited to, those listed in this section.
  - a. Project Schedule showing each work task, date of commencement and date of completion using a GANTT format bar chart with preference that task durations do not exceed 21 days.
2. Shop Drawings (PE stamp required)
  - a. Section 107 – As-builts
3. Certifications and Material Approvals: The Contractor must submit materials and site preparation certifications for the City's approval according to the project specifications and special provisions incorporated by reference and contained herein.

## CATEGORY 100 – PRELIMINARY (MSHA-BASED)

GENERAL NOTE: The referenced MSHA Sections and Subsections apply unless noted otherwise elsewhere in the Contract Documents. In case of conflict between MSHA specifications and other Contract Documents, the requirements of the other Contract Documents shall apply.

### **SECTION 101 – CLEARING AND GRUBBING**

#### **Line Item 1: Clearing and Grubbing (LS)**

##### DESCRIPTION:

Comply with Subsection 101.01 of MSHA and Section 120 of these specifications unless noted otherwise on Contract Documents. This work consists of clearing and grubbing within the limits specified in the Contract Documents. Clearing includes removing and disposing of all trees (less than 6" in diameter), brush, shrubs, vegetation, rotten wood, rubbish, fences and structures in construction area for removal and disposal, and trimming and disposal of tree limbs that interfere with performance of the Work. Grubbing covers removal and disposal of all stumps, roots, stubs, brush and debris within Limits of Disturbances specified in the Contract Documents. No tree greater than 6 inches in diameter, not explicitly shown to be removed in the Contract Documents, may be removed without prior approval by the Owner.

##### MATERIALS:

Comply with Subsection 101.02 of MSHA unless noted otherwise on Contract Documents.

##### CONSTRUCTION:

Comply with Subsection 101.03 of MSHA unless noted otherwise on Contract Documents.

1. This site is subject to an approved Planting Plan and Forest Preservation Plan. The contractor must schedule an inspection by, and obtain approval from the City of Gaithersburg prior to any land disturbing activities (including clearing, stripping, and grading). Notice must be provided at least 2 business days prior to the start of any such activities.
2. Erosion and sediment control measures and tree protection devices must be in place prior to mass clearing and grubbing operations.
3. Vegetation: The Contractor must mark (do not use paint) the clearing limits including any trees, shrubbery, and plants that are to be removed, as well as those that are to remain and be protected, prior to work. The Owner and other appropriate regulatory agencies must review and approve the clearing limits. The Contractor must protect the marked items from any damage. Branches and exposed roots of trees overhanging and interfering with the Work must not be cut without the Owner's prior approval. All trimming must be done under the field supervision of a tree expert furnished by the Contractor and licensed by the State of Maryland, including trimming of trees by the Contractor for any other reason. Trimming, and/or repair of cuts and scars must be properly bandaged (Referenced Standards: American National Standard Institute (ANSI), "American National Standard for Pruning.")
4. Grubbing:

- a. All embedded stumps and roots must be removed to a depth of not less than 3 feet below the subgrade or slope surfaces. Depressions made below the subgrade or slope surfaces by removal of stumps must be refilled with soil or as specified on Contract Documents.
- b. In the area of a dam embankment, all embedded stumps and roots must be completely removed on the embankment or beneath the embankment subgrade. Depressions made below the subgrade or embankment surfaces by removal of stumps must be refilled with materials suitable for dam embankment construction, and compacted in accordance with USDA, Natural Resources Conservation Services, "Code MD-378" requirements, hereinafter referenced as MD-378. The embankment material must be overlaid with 6" of top soil, seeded, and mulched. The final grade must match the adjacent grades.
- c. Disposal: Unless designated for reuse on the Contract Documents or meeting the special provisions provided herein, material and debris collected as a result of the clearing and grubbing operation is the property of the Contractor and must be disposed of in accordance with the local and state regulations. No burning will be permitted within the Work Site or on City of Gaithersburg or Montgomery County properties. Disposal of wood to the general public can be made so long as the wood piles do not interfere with the Work.

#### MEASUREMENT AND PAYMENT:

Clearing and Grubbing will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for performing all clearing and grubbing, tree removal and disposal, flush cut trees, and stump removal and disposal activities, tree trimming and scar repair, repair or replacement of damaged trees, restoration measures for damaged or destroyed protected resources, repair to other damaged properties, and for materials, labor, equipment, tools, and incidentals necessary to complete the work.

## **SECTION 104 – MAINTENANCE OF TRAFFIC**

- Comply with MSHA Subsection 104.00 to perform all work necessary for traffic control during construction and 813 to install necessary signage unless noted otherwise on Contract Documents.

### **Line Item 2: Maintenance of Traffic (LS)**

- Comply with MSHA Subsections 104.01 and 104.02, and 813 Signs

#### **DESCRIPTION:**

Contractor shall provide for Maintenance of Traffic as shown on the approved plans and in accordance with all local laws and regulations. Warning signs and pedestrian traffic detour signs shall be installed according to MSHA Subsection 813 and applicable City of Gaithersburg traffic control requirements. Work shall be performed in accordance with the MSHA Subsections listed above unless noted otherwise on Contract Documents. Work shall be performed in accordance with MSHA and/or MC-DOT requirements; whichever is applicable.

#### **MATERIALS:**

Comply with MSHA Subsections listed above unless noted otherwise on Contract Documents.

#### **CONSTRUCTION:**

Comply with MSHA Subsections listed above unless noted otherwise on Contract Documents.

#### **MEASUREMENT AND PAYMENT:**

Maintenance of Traffic shall be paid for at the Contract Lump Sum (LS) price bid for item "Maintenance of Traffic". Payment shall include the cost of signage, installation / placement, replacement and removal as required and shown on the plans.

## SECTION 107 – CONSTRUCTION STAKEOUT

### Line Item 3: Construction Stakeout & As-builts (LS)

#### DESCRIPTION:

Comply with Subsection 107.01 of MSHA unless noted otherwise on Contract Documents. This work consists of providing a construction layout (stakeout) performed by a licensed surveyor currently registered in the State of Maryland. Also, see Article 5.6.2, Construction Stakeout, in the General Conditions of Construction Contract.

Note: In addition to the items listed below to be provided by a licensed surveyor, the Contractor must provide construction stakeout as incidental to all related construction work. The Contractor must use competent personnel and appropriate equipment for all work required to set and maintain the elevations and dimensions as specified in the Contract Documents. This stakeout must be installed to the satisfaction of all appropriate permit inspectors before any operation commences. If any discrepancies between plan and field conditions are found, the Contractor must resolve any needed field adjustments with the Owner before starting construction.

- (a) The Contractor shall provide and have available to the project an adequate survey staff which is competent and qualified to set all lines and grades needed to construct the stream restoration.
- (b) The Contractor shall make all field measurements necessary to stakeout the baseline of construction and lay out the lines and grades called for in the Contract Documents or as directed by the Engineer. The Contractor shall use the horizontal and vertical survey controls (established control points or benchmarks) as shown in the Contract Documents to lay out the lines of work, limits of grading, planting, fill placement and to stake out the location of all proposed structures.
- (c) Only those benchmarks shown on the Contract Documents shall be used for construction. The Contractor shall furnish the assistance for benchmark preservation after being set. The Contractor shall be held responsible for their preservation. If, in the opinion of the City, the benchmarks are willfully or carelessly disturbed or destroyed by the Contractor or his/her employees, the entire cost of replacing them shall be charged against the Contractor and the cost shall be deducted from the Contractor's final payment.
- (d) The Contractor shall, as a part of his/her construction stakeout operation and before any clearing operation commences, demarcate any wetlands, Limit of Disturbance, and Tree Protection Areas throughout the entire project as shown on the Contract Documents and labeled as Limit of Disturbance and/or Wetlands, to the satisfaction of the Engineer and City.
- (e) Construction stakeout shall occur prior to the pre-construction meeting. Trees to be protected during construction will be identified by the City, Engineer, and the Contractor during the pre-construction meeting. All tree protection devices shall be installed before clearing and grubbing commences. Trees to be protected during construction shall be identified by flagging, fencing, and/or planking. No paint shall be used to indicate saved trees.
- (f) The Contractor shall notify the City once the stakeout or a phase of the stakeout is completed. The City and Engineer will inspect the construction stakeout prior to the Contractor beginning clearing and grubbing activities. The purpose of the inspection is not to verify the stakeout, but to allow the City and Engineer an opportunity to assess the lines established by the Contractor prior to the start of construction. If there are obvious errors with or questions concerning the stakeout, the visible errors and questions will be discussed with the Contractor, prior to the Contractor proceeding with clearing and grubbing or construction. **This inspection will in no way relieve**

**the Contractor of his/her responsibilities to construct the site as specified in the Contract Documents.**

- (g) The existing elevations and contours shown on the plans, cross-sections, stream bottom profiles, and/or bank alignment shown on the Contract Drawings were correct when surveyed in March 2016. However, because of interim vegetation growth, freeze/thaw action, and channel erosion and deposition, existing elevations and grades may have changed since the original survey was completed. It is the Contractor's responsibility to confirm existing grades and adjust quantities, earthwork and work efforts as necessary at no additional cost to City.

#### MATERIALS:

Comply with Subsection 107.02 of MSHA unless noted otherwise on Contract Documents. The surveyor must use marker materials that can be maintained by the Contractor during the course of construction.

#### CONSTRUCTION:

Comply with Subsection 107.03 of MSHA unless noted otherwise on Contract Documents

The Contractor must have the licensed surveyor provide the following:

1. Baseline Stakeout.
  - a. A licensed surveyor must stakeout all construction baselines. The stream channel baseline of construction shall be staked with minimum 3-ft long, untreated wooden stakes. The maximum spacing of stations (stakes, nails, crosses, etc.) will be 25 ft, and the elevations on the top of each marked point will be furnished. The beginning, apex, and end of each meander or curve shall be staked. The Contractor shall establish appropriately spaced benchmarks and the necessary references including all points of intersection (P.I.), points of curvature (P.C.), point of reverse curvature (P.R.C), and points of tangency (P.T.) for the preservation and control of the base line.
2. Site Stakeout.
  - a. Right-of-Way and Easement Lines: Where required by the Contract Documents, the Contractor must have a surveyor define right-of-way and easement lines of the project for adjacent property owners.
  - b. Stream Channel and Floodplain Grading Stakeout: The Contractor shall stake the baselines of construction as indicated in the Contract Documents. Additionally, the floodplain grading, wetland extents and floodplain contours shall be staked out. The stakes shall be clearly labeled with appropriate stations and elevations. Upon completion of grading, the Contractor will provide a staked baseline or working line. An elevation for the top of each marked point will also be furnished, as well as two sets of prints of the cross sections. In areas where the existing conditions prohibit stakeout as described above alternate methods of stakeout including, but not limited to marking of stones and offset stakes may be approved by the City Engineer.
  - c. In-Stream and Adjacent Structure Stakeout: For in-stream and channel-adjacent structures, the Contractor shall stake out the boundaries, all breaks in slope, and finish grade elevations with a maximum spacing of 10 ft. Stakes will be used to mark spot elevations and bank toes and top of bank will be flagged with pin flags.

- d. Special Circumstances: The contractor shall stake out all special features, including the location of existing wetlands not to be impacted, structures, or channel features to be preserved, at the direction of the City and the Engineer.

### 3. As-built survey

- a. An as-built survey of the completed Work shall be performed and shall include but not limited to: horizontal dimensions, grading limits, elevations, slopes, types/length/height of restoration features, and any new pipes, structures, profiles or typical details. The as-built survey shall include a final as-built topographic survey for all grading and stream measures; a final as-built survey of all storm drain and sewer structures must also be performed for inverts and distances.
4. Equipment and Personnel: Where a licensed surveyor is required, the surveyor must be currently registered in the State of Maryland.
  5. Control Markers: The Contractor must preserve the center line and bench marks set by the surveyor. When the center line and bench marks are disturbed or destroyed, they must be replaced by the Contractor at no additional cost to the City.
  6. Control Stakes: For construction baselines, the surveyor must furnish and set stakes at each station as shown on the Contract Documents or offset along one side of the project as site conditions require and per the City's approval. As applicable, each of these stakes must be marked with its offset distance from the center line along with key reference elevation(s) needed for proper construction. Maintenance of surveyor stakes and additional stakes needed for the horizontal and vertical controls necessary for the correct layout of the work must be provided by the Contractor at no additional cost to the City.
  7. Utilities: When applicable, the Contractor must furnish to the utility companies or agencies working within the limits of the project, reference information related to control points, alignment and grade data. These must be furnished promptly upon request, so that the utility companies may properly locate and coordinate their work related to the project.

### MEASUREMENT AND PAYMENT:

Construction Stakeout will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for furnishing, placing and maintaining construction layout stakes, flagging of disturbance and wetland limits, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. Payment of the Contract lump sum price will be prorated and paid in equal amounts on each monthly estimate. The number of months used for prorating will be the number estimated to complete the work.

As-built survey will not be measured but will be incidental to the Contract lump sum price for Construction Stakeout.

All other stakeout maintenance and flagging of clearing limits, wetlands, etc., shall be incidental to, and included in this line item.

## **SECTION 108 – MOBILIZATION**

### **Line Item 4: Mobilization/De-Mobilization (LS)**

#### **DESCRIPTION:**

Comply with Subsection 108.01 of MSHA unless noted otherwise on Contract Documents.

#### **MATERIALS:**

Comply with Subsection 108.02 of MSHA unless noted otherwise on Contract Documents.

#### **CONSTRUCTION:**

Comply with Subsection 108.03 of MSHA unless noted otherwise on Contract Documents.

#### **MEASUREMENT AND PAYMENT:**

Comply with Subsection 108.04 of MSHA except as noted below and otherwise noted on Contract Documents.

If the Contractor has to shut down due to stream closures, remobilization will not be paid.

## SECTION 120 – TREE PRESERVATION

### Line Item 5: Tree Protection Planking (EA)

#### DESCRIPTION:

This work includes implementing arboricultural activities related to tree preservation and protection of existing trees on site as shown on plans and directed by the Owner and/or approval agencies. The work includes, but is not limited to, tree protection fencing and signs, tree trunk protection, pruning, root pruning, mulching, fertilization, and other remedial activities.

Comply with Subsection 120.01 of MSHA unless noted otherwise on Contract Documents.

#### SUBMITTALS:

Qualifications to be submitted include the following: Contractor will provide an arborist with current certification from the International Society of Arboriculture or the American Society of Consulting Arborists (ASCA) and is a Maryland Licensed Tree Expert. This person shall be responsible for seeing that all work is performed to standards in a safe and professional manner.

#### QUALITY ASSURANCE:

1. Equipment: All applicable Federal, State, and Local regulations shall be followed. The Contractor will be responsible for damage to property resulting from equipment, including fluid leakage or damage resulting from equipment failure. All incidents of this type shall be reported immediately to the Owner.
2. Safety shall be a primary concern while working on the property. Qualified company shall have an established safety program and adhere to all OSHA and ANSI standards applicable to the tree care industry. This includes all electrical and utility requirements as well as personal equipment and safe work procedures. All accidents resulting in property damage or personal injury shall be reported immediately to Owner.
3. The Contractor shall be responsible for any damage to structures, installations, fixtures, paving, concrete, plant materials and any other items on the property which result from the execution of work prescribed. All work is to be performed in the safest manner possible in order to avoid damage of any kind.
4. Herbicide Applications: If pesticide applications are required, a Certified Pesticide Applicator shall be responsible for supervision of all applications of pesticides on the property. The name and certification number of certified applicator(s) assigned to this job shall be submitted to Owner. All pesticides shall be applied in strict accordance with Invasive Plant Control by Herbicide Application in these specifications. All pesticide applications shall be approved by the Owner prior to application. Pesticide Labels and Material Safety Data sheets shall be available for all pesticides while on the site.

#### DEFINITIONS:

1. Tree Diameter shall be defined as diameter at breast height (dbh) which is the average tree diameter at 4.5 feet, measured from the ground on the uphill side of the tree.
2. Tree Caliper shall be defined as the diameter of the trunk at 6" above the soil for trees up to 6" in caliper and diameter at 12" above the soil for trees up to 12" caliper.

3. Critical Root Zone shall be defined as 1.5-foot of radius for every inch of trunk diameter at four feet six inches above ground level on the uphill side of the tree.
4. Tree Preservation Area shall be defined as all areas outside limits of construction which contain trees and all areas within the limits of construction which are designated as tree preservation areas on the plans and/or in the field by fencing and signage.

#### MATERIALS:

Comply with Subsection 120.02 of MSHA except as noted below and otherwise noted on the Contract Documents.

#### Tree Protection Planking:

1. Wooden planks must be a minimum of 1.5 inch thick. Planks must be placed to a height of 10 feet, starting at 18 inches above the ground. Space between planks must be no greater than 2 inches.
2. Burlap Fabric
3. Rope: Fiber or nylon rope with a minimum diameter of ½ in. or 10 gauge wire.
4. Steel Staples: Galvanized steel staple of sufficient gauge and length to secure rope/wire to the planking

#### CONSTRUCTION:

All trees on site which are to be preserved will be prepared and treated to maximize their potential for survival and improve their health and condition. All work will be performed to meet or exceed current industry standards. This will also meet the minimum of the most recently published City Tree Manual or ANSI standard and County Forest Requirements, whichever is most applicable. Comply with Subsection 120.03 of MSHA unless noted otherwise on Contract Documents.

1. Schedule: Contractor's Arborist shall be responsible for field supervising all arboricultural activities included within the scope of this specification. All activities will commence immediately upon notice to proceed. Activities will be completed in a continuous manner and coordinated to prevent delay of other construction processes.
2. Labor: The Contractor will dedicate labor and equipment as necessary to complete the work. It shall be the Contractor's responsibility to maintain a consistent crew on the job site in order to complete work in a timely manner. It will be the Contractor's Arborist's responsibility to supervise work and scheduling and see that work progresses in an efficient manner.
3. Meeting: The Contractor shall contact the City of Gaithersburg and Owner's representative to set up a pre-construction meeting in the field to review the location of trees to be saved and limits of construction. Any potential conflicts between construction and preservation shall be addressed at that time.
4. Notifications: Contractor shall notify the Owner of any site condition changes which may affect work progress.
5. Initial Work: No other construction activity may occur on site until tree preservation fencing has been installed and approved by the Owner and the City of Gaithersburg Inspector.

6. Construction Activity: All construction activity within the areas fenced off around the trees shall be prohibited. This shall include the following activities:
  - a. Parking or driving of equipment, machinery or vehicles of any type.
  - b. Storage of any construction materials, equipment, stockpiling, excavation or fill, soil, gravel, etc.
  - c. Dumping of any chemicals, (e.g. paint thinner from cleaning brushes), wash-out materials from cleaning equipment, concrete or mortar remainder, trash, garbage, or debris of any kind.
  - d. Burning within or in proximity to protected areas.
  - e. Felling trees into protected areas.
  - f. Trenching or grading within the Critical Root Zones of protected trees for any purpose without notifying the Owner 10 days in advance of operation in writing. This includes utilities, lighting, irrigation, drainage etc.
7. Subcontractor: The Contractor shall be responsible for ensuring that all subcontractors are aware of tree preservation specifications.
8. Location: Contractor will be responsible for installation of tree protection planking around trees and groups of trees to be preserved. See plan for location.
9. Flagging: Prior to installation, Contractor shall flag location of planking in field for verification by the Owner.
10. Tree Protection Planking:
  - a. Planking will be required on trees identified in the Plans, as designated by the Engineer, or when construction activity occurs within 5 ft of trees. Do not perform any construction activities within 10 ft of trees designated for planking until planking is installed.
  - b. Manually place burlap fabric around tree trunk surface extending to cover all areas where planking and rope/wire will be placed.
  - c. Manually place planking along all required trees such that all faces of the tree facing construction activity are protected. Extend planking up the tree to an elevation 12 ft above existing ground level. Extend planking to the elevation of the lowest branch, in the case wherever branches prevent plank installation to the specified elevation and cut planks to required length on-site.
  - d. Tightly wrap each plank with wire/rope securing them together. Staple the wire/rope to the plank to secure the wire/rope in place. Place wire/rope every 3 ft along the length of the plank. Firmly secure planks around the entire diameter of the tree trunk.
  - e. Maintain tree planking throughout the construction period. Remove all tree planking following the construction period as approved.
11. Root Pruning: Perform root pruning as determined in the field in conjunction with both tree protection and sediment control fencing and approved and directed by the Owner. Root pruning shall be performed wherever grades will be lowered within the critical root zone of a tree to be preserved. Root pruning shall be to the depth of excavation, or 24 inches, whichever is less. An approved trencher or vibratory plow shall be used to prune roots. The blade will be sharpened daily prior to the beginning of the operations. The supersonic air tool will be used

when roots larger than 2" in diameter are exposed to facilitate root pruning or when root pruning the inner third of a trees critical roots. Roots over 1-1/2" in diameter shall have a clean cut made on the surface of the root which is still attached to the tree. This cut shall be made with a handsaw or chain saw as soon as larger root is severed is encountered.

Backfill the root-pruning trench with excavated soil, mulch and mark location for future reference. Silt fence may be installed in trench prior to backfilling as long as trench is not open for longer than 48 hours without watering.

Root pruning work must not be done when more than the top one-inch of soil is frozen. Root pruning must not be undertaken when the soil is wet and conditions are muddy.

12. Damage: Contractor will provide services as necessary to respond to damage by construction activities within 48 hours of notification by the Owner.

#### MEASUREMENT AND PAYMENT:

Payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The price must include off-site removal of all related materials. Tree preservation shall be paid for at the Contract unit price for Orange Construction Fence and Tree Protection Planking. Tree preservation specifically shall also include all special tree preservation measures shown on the Erosion and Sediment Control Plans and Forest Conservation Plans.

Orange Construction Fence shall be paid for per the Orange Construction Fence Special Provision.

Tree Protection Planking shall be paid at the Contract unit price per each (EA) tree protected. The payment will be full compensation for all timber, rope, transportation, preparation, installation, maintenance, disposal of excess material, removal and disposal of material following project completion, labor, equipment, tools, and incidentals necessary to complete the work.

## **SECTION 100 – ORANGE CONSTRUCTION FENCE**

### **Line Item 6: Orange Construction Fence (LF)**

#### **DESCRIPTION:**

The Contractor shall install Orange Construction Fence around the perimeter of the Limits of Disturbance (LOD) to protect natural resources. Orange Construction Fence shall also be installed as security fencing around the LOD to prevent unauthorized access, and/or in other areas indicated on the plans or as directed by the City of Gaithersburg or the Engineer.

#### **MATERIALS:**

Fence: Orange Construction Fence shall be Blaze or International Orange colored, mono- oriented laminar polyethylene plastic, U.V. stabilized material with a mesh size of 3 inches by 1.5 inches and porosity of 60%. The fence shall have a minimum height of 4 feet.

Posts: Posts for attachment of the fence shall be 2-inch by 2-inch wood posts, a minimum of 6 feet long or 5-1/2 ft high, 2 in. steel U-channel posts.

Ties: Ties for attachment of fencing to posts shall consist of plastic or wire of a gauge sufficient enough to bear the weight of the fencing on the posts.

#### **CONSTRUCTION:**

Drive posts into the ground to a depth of 12 to 18 inches. Posts shall be spaced every 8 to 10 feet. Roll fence out along the posts and secure fence to the posts using a minimum of three ties per post. Tension wire or rope may be used as a top stringer and woven through the top row of strands of the fence to prevent potential sagging.

The Contractor may elect to install Orange Construction Fence in another manner if approved by the Engineer. At such time that the construction is substantially complete and with the Engineer's approval, the Contractor shall remove the fence, fence posts and other materials, which then becomes the property of the Contractor. The Contractor shall maintain fencing throughout the life of the project. The contractor shall repair fallen, damaged, or broken sections of fencing at the end of each work day and shall maintain the security of the site during periods of inactivity. Should construction sequencing allow, and with the approval of the Engineer, fencing from a completed section of the project site can be removed and reused on the site.

#### **MEASUREMENT AND PAYMENT:**

The payment will be full compensation for the installation, removal, and maintenance of and for all materials, fence, posts, ties, labor, equipment, tools and incidentals necessary to complete the work. Orange Construction Fence will be measured and paid for at the Contract unit price per linear foot (LF) for the actual number of linear feet installed, measured to the centers of end posts. Fencing reused on-site following completion of a section of the site will be paid for at the same unit cost as the initial installation.

## CATEGORY 200 – GRADING (MSHA-BASED)

**GENERAL NOTE:** The referenced MSHA Sections and Subsections apply unless noted otherwise elsewhere in the Contract Documents. In case of conflict between MSHA specifications and other Contract Documents, the requirements of the other Contract Documents shall apply.

**General Description:** Work consists of all labor, materials, equipment, dewatering, sheeting and shoring, and services necessary for and incidental to the execution and completion of Grading (Earthwork), as indicated on the Contract Documents and specified herein. The extent of excavation, filling, and grading is shown in the Contract Documents. Preparation of subgrade for slabs and pavements is part of this Work. Backfilling required to establish proposed grade around facilities such as structures, curbs, pavements etc. is included as part of this Work.

All borrow sites and off-site disposal sites utilized by the Contractor to perform work under this Contract must have all necessary State, City, and County permits. The Contractor must identify these sites and provide a copy of appropriate permit(s) to the Owner prior to starting work.

Note: Excavation and backfilling of native material incidental to the installation of in-stream structures and should be included as incidental to the Unit Costs for those items provided in these specifications.

### **Existing Utilities:**

1. Notify "Miss Utility" a minimum of 48 hours prior to performing earthwork by calling 1-800-257-7777. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations. The Contractor must repair any Contractor damage to utilities shown on the Drawings or identified in the field. All utility work must be done in accordance with specific utility requirements including the use of utility-approved contractors and/or inspectors as appropriate; all costs for utility requirements shall be borne by the Contractor.
2. Should piping or other utilities (not shown on the Drawings) be encountered during excavation, stop work in that area and consult the Owner immediately for direction. Cooperate with the City, County, and utility companies in keeping respective services and facilities in operation. Repair any Contractor-damaged utilities to satisfaction of utility company.
3. Do not interrupt existing utilities serving occupied facilities, except when permitted in writing by the Owner, and only after acceptable temporary utility services have been provided.
4. The location of existing utilities shown on the plans and profiles are approximate and it shall be the Contractor's responsibility to determine the exact location of the utilities prior to commencing work in all areas of possible conflict. All test pits must be completed in coordination with the City and the affected utility companies. The existence of utilities other than those shown on the plans is not known. If, during construction operations, the Contractor should encounter additional utilities, he shall immediately notify the City and take all necessary and proper steps to protect the continuance of service of such facilities.

### **General Execution Requirements:**

1. Use of Explosives: The use of explosives is prohibited unless authorized in writing by the Owner.
2. Protection: See items 2a-2c for below minimum protection requirements:

- a. Safety: Provide protective measures necessary for the safety of the workers, public, and adjacent property. Prevent cave-ins, collapse of walls, structures and slopes, both on and adjacent to the site.
- b. Standards: Comply with regulations of local authorities having jurisdiction, including all applicable OSHA and MOSH requirements.
- c. Repair: Remove damaged materials and replace with new materials (as required by the Contract Documents) where such materials are affected by settlement or other damage caused by improper earthwork.

## SECTION 202 – CHANNEL OR STREAM CHANGE EXCAVATION (CLASS 5)

### Line Item 7: Class 5 Excavation (CY)

#### DESCRIPTION:

Comply with Section 202 of MSHA except as noted below.

This section includes excavation, separation, removal and disposal of debris and unsuitable materials from the stream channel, and salvaging, stockpiling and placement of suitable materials in areas designated on the plans and as outlined below. All concrete and masonry removed from the channel is considered unsuitable material. Excavation will be measured as the difference between an existing and the final design grades (e.g., cut) as shown on the Contract Documents. Earth excavated for reuse as fill onsite must be kept in separate stockpiles for general soil regrading as required by the Contract Documents, Owner, Owner's Representative, or Permit Inspectors.

#### LAYOUT:

The layout of the grading shall be as shown on the Contract Drawings (plans, profiles and cross-sections). Grading shall transition smoothly between cross-sections, with no abrupt changes in channel geometry.

EXCAVATION: Excavation shall include the following:

1. Cut areas within the boundary faces of the cross-sections specified in the Contract Documents, including excavation within the channel, banks or floodplain for stream channel restoration activities. This shall include excavation for the installation of stone structures, channel bed materials, and bank treatment techniques, as specified on the plans and in these specifications.
2. Demolition and/or removal of debris from the stream channel, including trees indicated for removal and debris jams, tires, concrete lining, and broken up concrete and other materials as designated by the Engineer.
3. Additional rock encountered within the stream channel that may be handled by the same tools and equipment used for channel or stream excavation under this Contract.
4. When excavating for stream restoration or other structures indicated on the plans, the Contractor will encounter wet or saturated soils. The Contractor shall be prepared to dewater and transport saturated soil off-site in a manner that prevents discharge or spillage of soils or water onto adjacent properties or roads. Should any discharge occur, the Contractor shall be responsible for immediate and complete clean-up.

MATERIALS: Not Applicable

#### CONSTRUCTION:

- Grading Units: Refer to Subsection 201.03.01 Grading Units of MSHA.
- Site Clean-up: Prior to undercutting any stream invert, cutting into any stream bank, or excavating the site, the reach that is being constructed shall be cleaned of all non-desirable items such as waste concrete, metal, vegetation debris, and rubbish prior to stockpiling. The Contractor shall be responsible for removing as much unnatural or undesirable material as

possible prior to salvaging and stockpiling of the suitable on-site materials. Disposal of non-desirable material shall be the responsibility of the Contractor.

- Use of Excavated Materials: Refer to Section 201.03.02 of MSHA.
- Disposal of Unsuitable Materials: Existing debris, concrete, waste, and other unsuitable materials, as determined by these specifications or by the Engineer, shall be removed from the site and shall be disposed of at a site with an approved erosion and sediment control permit.
- Rock Excavation:
  - Boulders and Rock. Boulders and rock from the excavation may not be broken and used for any of the proposed in-stream or bank structures unless authorized by the Engineer or provided for in the Contract Documents.
  - Blasting. The Contractor shall obtain prior approval from the Engineer before performing any rock blasting necessary to complete the excavation to the grades and lines indicated on the plans. All blasting shall conform to Section 201.03.04 (b) of MSHA.
  - Pre-splitting. The Contractor shall obtain prior approval from the Engineer before performing any pre-splitting activities, necessary to complete the excavation to the grades and lines indicated on the plans. All pre-splitting shall conform to Section 201.03.04 (c) of MSHA.
- Frozen Material: Frozen material shall be handled as specified in Section 201.03.05 of MSHA.
- Excavation Beyond Specified Limits: The widening of cut or excavation sections beyond the limits of the cross-sections, as specified in the Contract Documents, is prohibited in all instances except by written order from the Engineer. When so ordered by the Engineer, the procurement of additional suitable materials for fill, except as otherwise specified under Borrow Excavation, shall conform to the following provisions.
  - Finished Excavation: Refer to Section 201.03.08 (a) of MSHA.
  - Excavation Limits: If the Engineer directs the Contractor to excavate beyond the limits of the cross-sections originally proposed, and within the limits of disturbance, prior to the starting of earthwork construction in an excavation section, then all material within the limits will be classified as Class 5 Excavation.
  - Borrow Excavation Beyond Specified Limits: If the Engineer directs the Contractor to excavate beyond the limits of the cross-sections originally proposed and after the Contractor has substantially completed the excavation in a cut section, then all material removed beyond the limits of the cross-sections will be classified as Borrow-Excavation.
- Unsuitable Material and Undercuts: Unstable or other unsuitable material encountered at or below the lowest normal excavation limit, as specified in the Contract Documents, shall be undercut and removed to the extent directed by the Engineer. The undercutting and removal of unsuitable material shall be incidental Class 5 Excavation. In rock areas, the limit of measurement for excavation will be at the bottom of the normal plan section. All voids created by the removal of unsuitable material and undercuts, except when rock is encountered at subgrade, shall be backfilled to the lines and grades specified in the Contract Documents. Backfill material for undercuts shall conform to materials specified and shall be incidental to the Class 5 Excavation.

- Placement of Salvaged Materials. Salvaged suitable materials meeting the specifications described in the Contract Documents shall be placed as specified. See Section 200 Salvaged Subsoil.
- Stabilization: The Contractor shall be responsible for temporary and permanent stabilization of all stream bed and banks, immediately after the completion of grading, as specified in the Contract Documents. The Contractor shall perform all care and remediation work required to maintain stable stream bed and banks, including erosion and sediment control.
- Dewatering of the excavation area, including but not limited to stream pump-around or diversion, is required as part of the excavation.

#### MEASUREMENT AND PAYMENT:

Class 5 Excavation will be measured and paid for at the Contract unit price per cubic yard (CY) of material excavated. The payment will be full compensation for all excavation, hauling, salvaging, separating, stockpiling and placement of suitable materials, formation and compaction of embankments and backfill, backfilling old stream beds or otherwise disposing of excess and unsuitable materials, undercutting and backfilling of undercuts, and for all material, labor, equipment, tools, and incidentals necessary to complete the work. The cost of handling and re-handling wet soils and over-excavation to construct a temporary access bridge, if necessary, shall be considered incidental to the cost of Class 5 Excavation, as appropriate.

The contract quantity has been estimated based on survey and will serve as a basis for estimated payments. Payment shall include full compensation for all material excavated, stockpiled, and the removal of unsuitable and surplus materials. The total quantity shall be considered fixed, and the contractor will be paid the total quantity at the completion of grading without recalculation of actual quantities. It is the contractor's sole responsibility to determine the effort necessary to achieve the grades shown and make allowance for a complete job within the payment quantities. Salvaging, stockpiling, and placing Salvaged Subsoil will be incidental to the contract unit price for Class 5 Excavation.

Excavation required to meet subgrade for placement of any and all structures (stone, grade control s, etc.) on the Contract Drawings will not be measured and paid for separately and will be considered incidental to those structures.

## SECTION 200 – SUBSOIL

**Line Item 8: Salvaged Subsoil (CY)**

**Line Item 9: Furnished Subsoil (CY)**

### DESCRIPTION:

This work shall consist of placing subsoil material for grade adjustments as specified in the Contract Documents or as directed by the Engineer.

### MATERIALS:

Use of suitable materials for subsoil shall conform to the following specifications.

1. Salvaged Subsoil: Salvaged Subsoil shall be a natural, friable subsurface soil uniform in texture salvaged from the Class 5 excavation areas and shall conform to the specifications for Furnished Subsoil described below.
2. Furnished Subsoil: Furnished subsoil shall be a natural, friable subsurface soil uniform in texture and not salvaged from the project. The Contractor may not utilize Furnished Subsoil unless specifically directed by the City of Gaithersburg in writing. Subsoil shall be free from any parts of non-native invasive species as specified in this specifications package. The Contractor shall submit a source of supply for the material to the City of Gaithersburg or their representative for approval prior to use. Material shall have a maximum dry density of not less than 100 lb/ft<sup>3</sup> (1600 kg/m<sup>3</sup>), be free of roots, concrete, and stones larger than 3-inches. Frozen material will not be approved for use as subsoil.

### CONSTRUCTION:

When soil or weather conditions are unsuitable, the Contractor shall cease subsoil operations until directed by the City of Gaithersburg or their representative to resume.

Placing Salvaged Subsoil:

1. Evaluation: The City of Gaithersburg, Engineer, or ETR will evaluate salvaged subsoil for infestation with any parts (seed, rhizomes, stolons, roots, etc.) of non-native, invasive species prior to placing, to establish a means of preventing the spread of these noxious weeds.
2. Surface Preparation: The Contractor shall completely prepare and finish the surface of all areas to be covered with subsoil as specified in the Contract Documents. Immediately prior to being covered with subsoil, the prepared subsoil surface shall be in a loose condition and be free from stones or other foreign material 3 in. or greater. Subsoil will be placed according to the Contract Documents and Sections 702 or 703.
3. Loading and Hauling: Prior to the start of the hauling operations, all grass, weeds, brush, stumps, and other objectionable material shall be removed from the surface of stockpiles.
4. Placing, Spreading, and Compacting Subsoil: Subsoil shall be placed, spread, and compacted in maximum layers of 8 in. to produce a uniform firm layer of subsoil. Fill Material shall contain sufficient moisture to obtain the required degree of compaction with the equipment used. The “required degree of compaction” shall be understood to mean that, if the Fill Material is formed into a ball it shall not crumble and shall not be so wet that water may be squeezed from the material. The completed work shall be in conformance with the thickness, lines, grades, and

elevations specified in the Contract Documents. Stones and other foreign material larger than 4 in. shall be removed and disposed by the Contractor. Slopes 4:1 to 2:1 shall be tracked with cleated tract type equipment operating perpendicular to the slope.

5. Placing Furnished Subsoil: Refer to the Placing Salvaged Subsoil section above. Suitable salvaged material shall be used prior to furnished material.

#### MEASUREMENT AND PAYMENT:

Placing and compacting Furnished Subsoil will be measured and paid for at the Contract unit price per cubic yard installed. The payment will be full compensation for the preparation of surfaces, loading, hauling, placing, supplying, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Placing and compacting Salvaged Subsoil will not be measured and paid for and instead will be incidental to Class 5 Excavation.

## SECTION 200 – CHANNEL BED MATERIAL

**Line Item 10: Class I Channel Bed Material (CY)**

**Line Item 11: Class II Channel Bed Material (CY)**

**Line Item 12: Select Class II Channel Bed Material (CY)**

### DESCRIPTION:

Furnish and place Channel Bed Material as specified on the Contract Documents.

### MATERIALS:

1. Geotextile: Nonwoven Class SE 921.09.01 of MSHA.
2. Sand and Gravel: Refer to the Sand and Gravel Special Provision.
3. Channel Bed Material: Stone shall meet size gradations specified below and shown on the Contract Documents. Stone shall be brown or grey in color. No white stone will be allowed. The stone shall not disintegrate from the action of air, water, or in handling and placing. Granular sedimentary stone will generally be unacceptable. Concrete will not be considered as an alternative for stone. Material must be approved by the Engineer prior to construction.

<b>MSHA Riprap</b>	<b>D<sub>50</sub></b>	<b>D<sub>100</sub></b>
Class I	9.5 in.	15 in.
Class II	16 in.	24 in.
Select Class II	20 in.	24 in.

### CONSTRUCTION:

1. Utilize channel bed material to construct the proposed channel bed as shown on the Contract Documents.
2. Prepare the appropriate subgrade, place geotextile, and then place the appropriate size Channel Bed Material as specified on the Contract Documents.
3. Wash sand and gravel into all void spaces as specified in the Sand and Gravel Special Provision included elsewhere in this document.
4. Surface flow and the establishment of a defined thalweg must be achieved and approved by the Engineer.

5. Surface elevations, widths, and slopes shall conform to the proposed design stream profile and cross-sections specified on the Contract Drawings. Tolerances of the finished structure are as follows:
  - a. Surface Elevation: +/- 0.2 feet
  - b. Slope: +/- 0.1 percent
6. Placed material not conforming to the specified limits shall be removed and replaced as directed by the Engineer at no additional cost.

#### MEASUREMENT AND PAYMENT:

Channel Bed Material will be measured and paid for at the Contract unit price per cubic yard installed and approved. The payment will be full compensation for geotextile, preparation of surfaces, excavation, loading, hauling, mixing, placing, and supplying and for all material, labor, equipment, tools, and incidentals necessary to install Channel Bed Material per the Contract Documents. This will include washing-in Furnished Sand and Gravel to fill all voids and achieve surface flow.

Furnished Sand and Gravel will be measured and paid for separately according to the Sand and Gravel Special Provision.

Salvaged Sand and Gravel will not be measured and is considered incidental to Class 5 Excavation.

Geotextile will not be measured and paid for separately and will be considered incidental to the Contract unit price per cubic yard of Channel Bed Material.

## SECTION 200 — RIPRAP SLOPE AND CHANNEL PROTECTION

### Line Item 13: Class II Riprap Slope and Channel Protection (CY)

#### DESCRIPTION:

Comply with Subsection 312.01 of MSHA unless noted otherwise on Contract Documents.

This section includes the requirements for the provision and installation of riprap for the purpose of channel and slope stabilization in accordance with the Contract Documents.

#### MATERIALS:

Geotextile

Comply with Subsection 312.02 of MSHA except as noted below and noted otherwise on Contract Documents.

The material for riprap slope and channel protection be per Class II riprap 901.02 of MSHA and meet size gradations specified below and shown on the Contract Documents. Stone shall be brown or grey in color. No white stone will be allowed. The stone shall not disintegrate from the action of air, water, or in handling and placing. Granular sedimentary stone will generally be unacceptable. Concrete will not be considered as an alternative for stone. Material must be approved by the Engineer prior to construction. Select Class II slope and channel protection shall be graded so as to eliminate all riprap constituents below 12 in ( $D_{10}$  of 12 in).

MSHA Riprap	$D_{50}$	$D_{100}$
Class II	16 in.	24 in.

#### CONSTRUCTION:

Comply with Subsection 312.03 of MSHA except as noted below and noted otherwise on Contract Documents.

Excavation must conform to the lines and grades specified in the Contract Documents. The subgrade must be smooth and firm, free from protruding objects that would damage the geotextile, and constructed in a manner acceptable to the Engineer.

Geotextile Filter Cloth: Unless specified otherwise by Contract Documents, the geotextile must be placed on the prepared subgrade with the adjacent edges overlapping a minimum of 2 feet (0.6m). Geotextile torn or damaged must be replaced or repaired at the Contractor's expense in a manner acceptable to the Engineer.

Backfill: Any excavation voids existing along the edges of the completed slope and channel protection must be backfilled in a manner acceptable to the Engineer.

#### MEASUREMENT AND PAYMENT:

Class II Riprap Slope and Channel Protection shall be paid for at the Contract unit price per cubic yard installed. The payment will be full compensation for all applicable excavation, placing, geotextile, de-watering, hauling, storing, re-handling of material, removal and disposal of excess material, backfill,

grading and slope adjustments, and for all material, labor, equipment, tools, and incidentals necessary to complete the work as specified in the Contract Documents.

Geotextile will not be measured and paid for separately and will be considered incidental to the Class II Riprap Slope and Channel Protection.

## SECTION 200 – SAND AND GRAVEL

**Line Item 14: Salvaged Sand and Gravel (CY)**

**Line Item 15: Furnished Sand and Gravel (CY)**

**DESCRIPTION:** This item includes the selection and placement of salvaged or furnished sand and gravel as shown on the Contract Documents and as outlined in this special provision. This item as includes washing furnished sand and gravel into voids of approved channel bed material and other structures as specified in the Contract Documents or as directed by the Engineer.

### **MATERIALS:**

Use of suitable materials for subsoil shall conform to the following specifications.

1. Salvaged Sand and Gravel: Salvaged Sand and Gravel shall meet the specifications and gradation for Furnished Sand and Gravel outlined and below salvaged from the Class 5 excavation areas and shall conform to the specifications for Furnished Subsoil described below.
2. Furnished Sand and Gravel: The Contractor may not utilize Furnished Sand and Gravel unless specifically directed by the City of Gaithersburg in writing. Furnished Sand and Gravel shall meet the below gradation specifications. Furnished Sand and Gravel shall not be composed of Riprap. Sand and stones shall be brown in color, no white sands or stones will be accepted. No limestone shall be accepted; only stone conforming to the native geology of the site shall be accepted. The Engineer shall approve the size and composition of all Furnished Sand and Gravel prior to hauling to the site.

<b>% Particle Size Less Than</b>	<b>Particle Diameter Passing through Sieve (in) or Sieve No.</b>
100	2.5 in
85	1 in
50	0.5 in
30	No. 40
16	No. 200

### **CONSTRUCTION:**

Sand and Gravel material shall be used to fill voids in approved Class 0 and Class I Channel Bed Material or where else specified in the Contract Documents. Material must be washed into the void spaces as specified in the Contract Documents to ensure surface flow.

### **MEASUREMENT AND PAYMENT:**

Measurement and Payment for Furnished Sand and Gravel will be at the Contract unit price per cubic yard installed and approved. Payment will include full compensation for the preparation of surfaces, loading, hauling, placing, washing-in and supplying and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Placing and washing-in Salvaged Sand and Gravel will not be measured and paid for and instead will be incidental to Class 5 Excavation.

## CATEGORY 300 – DRAINAGE (MSHA-BASED)

GENERAL NOTE: The referenced MSHA Sections and Subsections apply unless noted otherwise elsewhere in the Contract Documents. In case of conflict between MSHA specifications and other Contract Documents, the requirements of the other Contract Documents shall apply.

### **SECTION 308 – EROSION AND SEDIMENT CONTROL**

**Line Item 16: Stabilized Construction Entrance (TON)**

**Line Item 17: Super Silt Fence (LF)**

**Line Item 18: Temporary Mulch for Access (SY)**

**Line Item 19: Temporary Stream Crossing (EA)**

**Line Item 20: Maintenance of Stream Flow (LS)**

#### GENERAL DESCRIPTION:

This Work consists of the provision and installation of all Sediment Control Devices as indicated in the Contract Documents. Control Devices must comply with the latest version of the Maryland Department of the Environment (MDE) “2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control” and “Maryland’s Guidelines to Waterway Construction” and all Montgomery County Department of Permitting Services (MCDPS) standards. In case of any conflict between standards, the MDE standards control.

Work includes measures to prevent erosion and run-off of earth and silt, methods to prevent the transport of sediment off-site by construction vehicles, dust control, and contact and coordination with the City of Gaithersburg Permits and Inspection Division staff and any other involved regulatory agencies throughout the project.

**The Contractor shall assume all Erosion and Sediment Control obligations and responsibilities placed on the Owner per the approved Erosion and Sediment Documents. The Contractor shall perform all layout, construction, scheduling, bookkeeping, notification, review and maintenance assigned to the Owner as the Erosion and Sediment Control permittee.**

#### DESCRIPTION:

Comply with Subsection 308.01 of MSHA except Subsections 308.01.03 and 308.01.04 unless noted otherwise on Contract Documents.

#### MATERIALS:

Comply with Subsection 308.02 of MSHA unless noted otherwise on Contract Documents.

All materials must be in accordance to MDE specifications for Soil Erosion and Sediment Control, MDE Construction Guidelines, and County standards unless otherwise specified in the Contract Documents.

Geotextile fabrics must conform to Section H of the MDE “2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control”.

Stabilized Construction Entrance: Filter Cloth and stone. Stone shall be crushed aggregate (2” to 3”) or reclaimed or recycled concrete equivalent.

Stabilized Construction Entrance with Temporary Asphalt in place of the Standard Stabilized Construction Entrance per Montgomery County Department of Permitting Services, Temporary Asphalt Entrance Closed Section Roads Guideline.

Super Silt Fence: Steel posts, Schedule 40 or "SS-40", 2.5" diameter, Fence Fabric, 2" x #9 gauge x 42" KK wire, Filter Fabric, MDSHA Class F.

Pump(s): Shall be large enough to maintain uninterrupted base flow to the channel downstream of the work area. The pump-around shall include a hose suitable to convey water over land to the downstream section. The minimum length of hose required (measured in linear feet) is equivalent to the maximum estimate for three workdays provided by the Contractor.

Soil Stabilization Matting: Refer to Line Item 38 (Section 709).

Sheeting: Sheeting shall consist of polyethylene or other material, which is impervious and resistant to puncture and tearing.

Sediment Filter Bag(s): must conform to MDE "2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control" as approved and as depicted in the Contract Documents.

Temporary Seeding: Refer to Section 704.

Temporary Mulch for Access: Shredded Hardwood Bark Mulch consists of natural wood and bark from hardwood trees that has been milled and screened to a max 4-in. particle size. Composted shredded hardwood mulch is not acceptable. Hardwood timber mats are incidental to this item and shall be three-ply 8-ft by 12-ft Hardwood Timber Mats or approved equal. Grading and additional stabilization will not be paid for and will be incidental to the price of the Temporary Mulch Access Road.

Straw mats (bales) with any type of plastic netting will not be accepted. The Straw/Single Jute Mat must be East Coast Erosion Blanket ECS-1B, Straw Biodegradable Single Net Blanket or City-approved equal and must provide biodegradable ground cover for seeding purposes with an estimated field life of less than 12 months.

Sand Bags: Sand bags must be made of UV resistant material, resistant to tear and puncture and woven tightly to prevent leakage of the sand. The sand bag must be at least 14" x 26" in size and hold a minimum of 50 pounds of sand.

Temporary HDPE pipe shall be flexible corrugated pipe.

The dewatering bag must be made of non-woven geotextile with a minimum surface area of 225 square feet per side. All structural seams must be sewn with double stitch using a double needle machine with high strength thread. The seam strength must withstand 100 lb/in using ASTM D-4884 test method. The dewatering bag must have a nozzle large enough to accommodate a 4 inch discharge hose. The geotextile fabric must be a nonwoven fabric with the following properties:

Weight:	ASTM D-3776	12oz/yd
Grab Tensile	ASTM D-4632	300 lbs
Puncture	ASTM D-4833	180 lbs
Flow Rate	ASTM D-4491	75 gal/min/sq ft
Permittivity	ASTM D-4491	1/1 sec
UV Resistance	ASTM D-4355	70%
AOS	ASTM D-4751	100

## CONSTRUCTION:

Comply with Subsection 308.03 of MSHA unless noted otherwise on Contract Documents.

1. The Contractor must employ a responsible person involved in the Project who has a Certificate of Attendance at a Maryland Department of the Environment approved training program for the control of sediment and erosion as the Superintendent/Supervisor. At anytime, the Owner may request proof of this Certification.
2. Upon issuance of the Notice to Proceed, the Contractor shall layout the Limits of Disturbance and mark utilities via Miss Utility interaction. After these activities are completed, the Contractor shall schedule a pre-construction meeting with the City of Gaithersburg Sediment Control Inspection staff, the Contractor, and other appropriate permit inspection staff. The Contractor must not access the Project Site for any reason other than visual observation and surveying prior to this meeting; no land disturbance activities are permitted prior to this pre-construction meeting.
3. The Contractor will be provided with a copy of the Sediment Control Permit and all other required permits at the pre-construction meeting (or earlier), and must keep a copy of each permit on the Project Site at all times.
4. Installation of sediment control devices must begin only after the City of Gaithersburg Sediment Control Inspector has granted approval, and must include any modifications to the approved Sediment Control Plan that the City of Gaithersburg Sediment Control Inspector has required. The City of Gaithersburg Sediment Control Inspector has the authority to make field modifications to the approved Sediment Control Plan. The Contractor must notify, and receive approval from, the Engineer before making any changes as directed by the Inspector. Upon approval by the Engineer, revised work shall be provided as required. The contractor is eligible for compensation for revised work in accordance with the Contract Documents.
5. All Sediment Control features must be constructed and installed in accordance with the Contract Documents or, if not indicated in the Contract Documents, then in accordance with the appropriate detail as specified in the MDE Specifications for Soil Erosion and Sediment Control and MDE Construction Guidelines. All proprietary sediment control devices must be installed per manufacturer's instructions.
6. All notifications for inspection and coordination with the City of Gaithersburg Sediment Control Inspector are the responsibility of the Contractor.
7. Events requiring Sediment Control inspection and approval include, but may not be limited to: start of land disturbance activities, compliance with warning notices, lifting of stop work orders for violations, start of temporary or permanent stabilization, removal of Sediment Control facilities, and any other pertinent events noted in the Contract Documents.
8. Grading must be accomplished such that existing surface drainage is not impaired, a potential hazard is not created, hazardous erosion will not occur, or sediment will not collect in existing drainage systems.
9. All sediment control devices must be maintained, inspected and repaired as necessary at the end of each working day and after each rain event. If sediment leaves the construction area, it must be removed immediately and the area must be cleaned to the satisfaction of the City. Inspections must be documented on the MDE Construction Activity Inspection Form as required

by permit. Completed inspection forms are required to be kept at the site in a notebook should an MDE representative wish to review them. Temporary stabilization must be provided.

The Contractor shall assume any Owner requirements identified on State or County Erosion and Sediment Control permit for the project. The Contractor must complete and comply with any formal transfer of permit responsibilities including completion and compliance with the MDE NPDES Transfer Form for individual and general permits, which must be filed with MDE by the Contractor. Once the NPDES permit conditions have been met, and the permit is ready to be closed, the MDE Notice of Termination must be filed for individual and general permits.

10. Removal of sediment control devices:

Once the Project has been completed, and all disturbed areas have been restored (seeded, sodded, paved, constructed, etc) as called for in the Contract Documents and there is a good stand of grass in the seeded/sodded areas, the Contractor must contact the City of Gaithersburg Sediment Control Inspector (with concurrent notification to the Owner and Engineer) for approval to remove the sediment control devices. The sediment control devices must be removed within 14 days from the date of the City of Gaithersburg Sediment Control Inspector's approval.

11. As permitted, after removal of all sediment control devices, the Contractor must re-grade affected areas to proposed designed grades and seed/or sod them as required for stabilization. **The Work is not considered complete until all temporary sediment control devices have been removed and all regrading and seeding/sodding is completed and the City of Gaithersburg Sediment Control Inspector has released the Sediment Control permit.**

12. Dust Control: The Contractor must provide water as necessary to reduce airborne dust when directed by the Owner, at no additional cost to the City.

13. Dewatering: Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding Project Site and surrounding area. Do not allow water to accumulate in excavations or other areas of the Site. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of sub-grades and foundations. Provide and maintain pumps, sumps, suction and discharge lines, and other dewatering system components necessary to convey water from excavations. Convey water removed from excavations and rainwater to collecting or run-off structures. Provide and maintain temporary drainage ditches and other diversions outside excavations limits for each structure. Do not use trench excavations as temporary drainage ditches. Dewatering activities must be performed at no additional cost to the City. Any repair to foundations which results from deficient dewatering is the sole responsibility and cost of the Contractor.

Dewatering (Filter) bags: Water encountered within the Site must be pumped through a dewatering (filter) bag before it is allowed to drain away from the Site. Dewatering setup must be made in accordance with the Contract Documents; if not shown; the filter bag must be placed so that the incoming water flowing into the bag will pass through the system and then off site without creating erosion. The neck of the system must be tied off tightly to stop water from flowing out of the system without passing through the walls of the bag. The filter bag must be placed over a wood chip (mulch) bed to allow the water to flow in all directions. The filter bag must be placed on level or gently sloping grade and secured in place by wooden stakes spaced at 5 feet on center.

Contractor shall provide adequate pump(s) for all dewatering. All dewatering installations must be inspected by appropriate permit inspectors and the Owner prior to being placed into operation.

Install standard Stabilized Construction Entrances (SCEs) in accordance with Contract Documents and MSHA 308 and applicable State, County, and City guidelines. The price must include off-site removal of all related materials upon project completion if required by the Inspector.

Temporary curb inlet protection must be installed around all storm drain curb inlets to control sedimentation into the storm drainage system if required by inspector.

#### Maintenance of Stream Flow (Stream Diversion):

Any stream diversion (maintenance of stream flow) must be set up and operated in accordance with the MDE Construction Guidelines Section 1.2 unless otherwise directed by the Owner. The Contractor must notify all applicable inspectors as well as the City of Gaithersburg Permits and Inspections Department 48 hours before initiating pump-around. If required, MDE will advise on fish removal requirements. All pumps must be maintained in proper working condition. All stream diversion outfalls must utilize a velocity reduction device to prevent erosion. Pipes must be checked regularly for leaks and repaired as necessary. Any piping that crosses paved trails must have a wooden ramp at a slope of 1:20 (vertical: horizontal) for pedestrian and bike passage. A warning sign must be placed in advance of the pipe crossing. Pump inlets must have a screen (mesh size <1 inch) over opening. If pump operations occur between 5pm and 7am, the Contractor must have an employee on site at all times to monitor pumping operations. Pumps utilized in the stream diversion must be in compliance with the City Noise Ordinance and if necessary the Contractor must construct devices to muffle pump noise at no additional compensation.

During all operations, the Contractor shall maintain continuous flow and operation of all waterways, channels and storm drains while minimizing the discharge of sediment to any watercourse. The Contractor shall conduct their operations in a manner that reduces the amount of sedimentation introduced into the stream to an absolute minimum. Dewatering of excavation areas directly into the stream is prohibited.

The height of the diversion structure shall be one half of the distance from streambed to the top of the streambank, plus one foot. Sheet piling shall be overlapped such that the overlying portion covers the underlying portion with at least an 18-inch overlap.

Maintenance of Stream Flow measures shall be maintained throughout the duration of the work to the Engineer's satisfaction. Any discharge of sediment resulting from the Contractor's construction shall be remedied to the satisfaction of the Engineer and the City of Gaithersburg Sediment Control Inspector at the Contractor's expense.

Upon completion of the work, after the drainage devices have served their purposes, and with the inspector's approval, the devices shall be removed and disposed of away from the project by the Contractor at their own expense. Removal and disposal shall be done in compliance with State and local erosion and sediment control and waste disposal requirements.

#### MEASUREMENT AND PAYMENT:

Comply with Subsection 308.04 of MSHA unless noted otherwise below or elsewhere in the Contract Documents. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work. The maintenance, repair, resetting, and final removal of all

erosion and sediment control devices will not be measured, but the cost will be incidental to the Contract price to construct the device unless otherwise specified in the Contract Documents.

Stabilized Construction Entrance will be measured and paid for at the contract unit price per ton and includes all excavation, geotextile, aggregate, pipe, rehabilitation, relocation and incidentals to complete the work.

Super Silt Fence will be measured and paid for at the Contract unit price per linear foot and includes rehabilitation and all incidentals to complete the work.

Temporary Mulch for Access will be measured and paid for at the Contract unit price per square yard and includes rehabilitation and all incidentals to complete the work.

Temporary Stream Crossing will be measured and paid for at the Contract unit price per each and includes all incidentals to complete the work.

Temporary Seeding will be paid per Section 704.

Soil Stabilization Matting will be paid per Section 709.

Maintenance of Stream Flow will not be measured but will be paid at the Contract lump sum price. The amount of payment shall be prorated over the time period the Maintenance of Stream Flow is required.

## SECTION 300 – BOULDER TOE PROTECTOIN

**Line Item 21: Floodplain Boulder Toe Protection (LF)**

**Line Item 22: Channel Boulder Toe Protection (LF)**

### DESCRIPTION:

This work shall consist of the placement of Class III angular boulders along the toe of banks, along select floodplain margins, and subgrade to prevent toe scour as depicted on the Contract Documents.

### MATERIALS:

**Class III Angular Boulders:** Class III Angular Boulders shall consist of angular rock of appropriate color (e.g., green, gray, brown/gray, dark gray, and/or dark brown in color); free from overburden, spoil, shale, and organic material. No white stone will be allowed. No round stone will be allowed. All stone shall be free from laminations and weak cleavages. The stone shall not disintegrate from the action of air, water, or handling and placing. Granular sedimentary stone will generally be unacceptable. Concrete will not be considered as an alternative for stone. The Boulders shall have a density of 160 lbs/ft<sup>3</sup> or greater. Boulders must be approved by the Engineer, and must be obtained from an approved source. Class III angular boulders shall be used for both Floodplain Boulder Toe Protection and Channel Boulder Toe Protection.

Boulders shall meet the following gradation requirements:

Weight (lbs)	Min. % Finer	Approx. Diameter (in)
2,200	100	36
1,600	50	32
1,200	0	29

Geotextile Class SE: Refer to the Channel Bed Material Special Provision.

Type D Soil Stabilization Matting: Refer to the Type D Soil Stabilization Matting Special Provision.

Floodplain Matting (Coir 1000 or similar): Refer to the Floodplain Matting Special Provision.

### CONSTRUCTION:

1. Excavation of bed and banks shall occur as described in the Contract Documents accounting for the proper subgrade excavation necessary for the placement of the Stone Toe Protection.
2. Class SE Geotextile shall be placed on the subgrade and along the streambank parallel to the direction of flow and as shown in the Contract Documents. Each layer shall overlap a minimum of 1 ft in a downstream direction. Geotextile torn or damaged shall be replaced at the Contractor's expense in a manner acceptable to the Engineer. Class SE Geotextile shall be keyed in, placed and trimmed to avoid exposed edges upon completion of construction.
3. Class III Angular Boulders shall be placed to lines and grades specified in Contract Documents, and tied into the existing channel substrate at the direction of the Engineer to establish a stable cross section. Boulder shall not be placed by dumping or similar methods.
4. Boulder shall be selected and placed to avoid the creation of voids.

5. Surface elevations of individual boulders shall be within 0.2 ft of the elevations specified on the Contract Documents.
6. Subsoil and/or Channel Bed Material shall be installed over the footer stones and along the Stone Toe to bring the channel bed of floodplain elevation to the grade specified in the Contract Documents.
7. The upstream and downstream extents of the Boulder Toe Protection shall be keyed-into the bank a minimum of 3.0 feet on a 45 degree angle at the direction of the engineer.
8. Placed stone not conforming to specifications shall be removed and replaced as directed by the Engineer at no additional cost to the City.

#### MEASUREMENT AND PAYMENT:

Boulder Toe Stabilization will be measured and paid for at the Contract unit price per linear foot (LF) placed and approved. The payment will be full compensation for all excavation, grading, furnishing and installing boulders; placement and repositioning of stones (if necessary); transportation, stockpiling, preparation, compaction, disposal of excess material; and for all material, labor, structure stakeout, equipment, tools, and incidentals necessary to complete the work. Boulder Toe used as part of the upstream and downstream keys will not be measured and paid for separately and is considered incidental to the LF cost.

Class SE Geotextile will not be measured and paid for separately and will be considered incidental to the Contract unit cost per linear foot of Boulder Toe Stabilization.

Type D Soil Stabilization Matting will be measured and paid for separately according to the Type D Soil Stabilization Matting Special Provision.

Floodplain Matting (Coir 1000 or similar) will be measured and paid for separately according to the Floodplain Matting Special Provision.

## **SECTION 300 – TOE WOOD**

### **Line Item 23: Toe Wood (EA)**

#### **DESCRIPTION:**

This work shall consist of placing logs along the banks protruding into constructed pools as specified in the Contract Documents to provide habitat.

#### **MATERIALS:**

Logs: Logs must have a trunk diameter of 4-6 inches and a minimum length of 8.5 feet. Harvest logs from trees removed during the clearing and grubbing portion of this Contract within the permitted limit of disturbance (LOD). All salvaged on-site hardwood logs shall be utilized prior to other species

#### **CONSTRUCTION:**

Harvested logs not meeting these requirements shall be approved by the Engineer before installation. If off-site logs are necessary, harvest location, species and length must be approved by the Engineer. Off-site harvesting location must meet all MDE/DNR tree harvesting laws per COMAR and must have erosion & sediment control approval.

Toe Wood is to be placed only at the locations specified on the Contract Documents. All branches shall be removed from logs prior to installation. Multiple logs shall be placed in a random overlapping crisscross pattern, 2-3 layers thick, with minimal opportunity for movement, with individual log bundles not to exceed 12" in thickness. The structure shall be incorporated into the furnished channel bed material, filling void space as necessary. The elevation of the top row of logs shall be 0.5 ft. below the invert of the downstream controlling riffle crest such that all logs are submerged. Logs shall protrude into the constructed pool in a staggered pattern, extending 2.5 ft to 3.0 ft from the proposed bank. All logs must extend a minimum of 6.0 ft into the bank.

#### **MEASUREMENT AND PAYMENT:**

Toe Wood will be measured and paid for at the Contract unit price per each structure installed that meets the material and placement requirements, regardless of the length or number of logs necessary to complete each structure. Logs will be harvested on-site logs if on-site logs are inadequate in quantity/total length. If off-site logs are required, transport of these materials to the site will incur no additional cost. Payment will be full compensation for furnishing, transport and all equipment and incidentals necessary to complete the work. Structures placed without consultation with the Engineer or ETR may need to be reset at the discretion of the Engineer or ETR at no cost to the City.

## SECTION 300 – BOULDER CASCADE

### Line Item 24: Boulder Cascade (EA)

#### DESCRIPTION:

This work shall consist of the installation of a Boulder Cascade to provide grade control as depicted on the Contract Documents.

#### MATERIALS:

Imbricated Boulders: Imbricated Boulders to be used for construction shall consist of angular flat rock that is rectangular in shape, and of appropriate color (e.g., green, gray, brown/gray, dark gray, and/or dark brown in color. No white stone will be allowed. No round stone will be allowed. All stone shall be free from laminations and weak cleavages. The boulder shall not disintegrate from the action of air, water, or handling and placing. Granular sedimentary stone will generally be unacceptable. Concrete will not be considered as an alternative for stone. The Boulders shall have a density greater than 160 lbs./ft<sup>3</sup>. Boulders shall have general dimensions of 3.0 x 2.0 x 1.5 ft. Length measurements along the Boulders shall have an allowable tolerance of 0.5 ft.; however, the minimum weight of any individual Boulder shall not be less than 0.7 tons. Boulders must be approved by the Engineer, and must be obtained from an approved source. Boulders shall have the following size requirements.

	A Axis (Long)	B Axis (Intermediate)	C Axis (Short)
Minimum Size	2.5	1.5	1.0
Maximum Size	3.5	2.5	2.0

Geotextile Class SE: Refer to the Channel Bed Material Special Provision.

#### CONSTRUCTION:

9. Excavation of bed and banks shall occur as described in the Contract Documents accounting for the proper subgrade excavation necessary for the placement of the Imbricated Cascade Boulders.
10. Class SE Geotextile shall be place on the subgrade parallel to the direction of flow and as shown on the Contract Documents. Each layer shall overlap a minimum of 1 ft. in a downstream direction. Geotextile torn or damaged shall be replaced at the Contractor's expense in a manner acceptable to the Engineer. Class SE Geotextile shall be placed and trimmed to avoid exposed edges upon completion of construction.
11. Imbricated Boulders shall be selected and placed to avoid the creation of voids. The outer rock surface shall be even and present a generally neat appearance such that it blends into existing grade at edges. Surface elevations or individual rocks within the finished installations shall be within 0.2 feet of the elevations specified on the Construction Drawings.
12. Placed material not conforming to the specified limits shall be removed and replaced as directed by the Engineer at no additional cost.

### MEASUREMENT AND PAYMENT:

Boulder Cascade will be paid for at the Contract unit price per each structure installed. Payment will be full compensation for the preparation of surfaces, removal of excess materials, loading, hauling, stockpiling, placing, mixing, washing-in, and supplying and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Class SE Geotextile will not be measured and paid for separately and will be considered incidental to the Contract unit cost per each Boulder Cascade.

## **SECTION 300 – ROCK STEP STRUCTURE**

### **Line Item 25: Rock Step Structure (EA)**

#### **DESCRIPTION:**

This work shall consist of the installation of Rock Step Structures to provide grade control and energy dissipation as depicted on the Contract Documents.

#### **MATERIALS:**

Imbricated Boulders: Refer to the Boulder Cascade Special Provision.

Geotextile Class SE: Refer to the Channel Bed Material Special Provision.

Select Class II Channel Bed Material: Installed at Watkins Mill Run Reach 1. Refer to the Channel Bed Material Special Provision

Class II Channel Bed Material: Installed at Watkins Mill Run Reach 2. Refer to the Channel Bed Material Special Provision

#### **CONSTRUCTION:**

1. Excavation of bed and banks shall occur as described in the Contract Documents accounting for the proper subgrade excavation necessary for the placement of the Imbricated Cascade Boulders and Class I Channel Bed Material.
2. Class SE Geotextile shall be placed on the subgrade parallel to the direction of flow and as shown on the Contract Documents. Each layer shall overlap a minimum of 1 ft. in a downstream direction. Geotextile torn or damaged shall be replaced at the Contractor's expense in a manner acceptable to the Engineer. Class SE Geotextile shall be placed and trimmed to avoid exposed edges upon completion of construction.
3. Imbricated Boulders shall be selected and placed to avoid the creation of voids. The outer rock surface shall be even and present a generally neat appearance such that it blends into existing grade at edges. Surface elevations or individual rocks within the finished installations shall be within 0.2 feet of the elevations specified on the Construction Drawings.
4. Class II and Select Class II Channel Bed Material (where applicable) shall be placed so that small and large stones are mixed to minimize void space and promote interlocking. Sand and Gravel shall be washed into the Channel Bed Material to ensure all interstitial voids are filled and surface flow is achieved. Dumping of stone will not be permitted.
5. Placed material not conforming to the specified limits shall be removed and replaced as directed by the Engineer at no additional cost.

#### **MEASUREMENT AND PAYMENT:**

Rock Step Structure will be paid for at the Contract unit price per each structure installed. Payment will be full compensation for the preparation of surfaces, removal of excess materials, loading, hauling,

stockpiling, placing, mixing, washing-in, and supplying and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Imbricated boulders will not be measured and paid for separately and will be considered incidental to the Contract unit cost per each Rock Step Structure.

Class SE Geotextile will not be measured and paid for separately and will be considered incidental to the Contract unit cost per each Rock Step Structure.

Class II and Select Class II Channel Bed Material will be measured and paid for separately as per the Class II and Select Class II Channel Bed Material Special Provision.

Sand and Gravel will be measured and paid for separately as per the Sand and Gravel Special Provision.

## **SECTION 300 – FLOODPLAIN GRADE CONTROL LOG STRUCTURES**

### **Line Item 26: Floodplain Grade Control Log Structure (EA)**

#### **DESCRIPTION:**

Salvage and place cut logs at grade across the valley and perpendicular to flow to help prevent rill erosion associated with floodplain flows as specified in the Contract Documents.

#### **MATERIALS:**

Logs: Minimum trunk diameter of 12 in. and a minimum length of 15 feet. Harvest logs from trees removed during the clearing and grubbing portion of this Contract within the permitted limit of disturbance (LOD). All salvaged on-site hardwood logs shall be utilized prior to other species.

#### **CONSTRUCTION:**

1. Harvested logs not meeting these requirements shall be approved by the Engineer before installation. If off-site logs are necessary, harvest location, species and length must be approved by the Engineer. Off-site harvesting location must meet all MDE/DNR tree harvesting laws per COMAR and must have erosion & sediment control approval.
2. Utilize a single log per structure wherever possible, minimizing overlapping joints. Multiple logs may be used to construct the grade control as illustrated in the Contract Documents where necessary due to valley width. Overlap logs a minimum of 3 ft when utilizing multiple logs.
3. Saw cut the end of each log and install per the Contract Documents allowing for a minimum key in of 3 ft. into the bank. Take care to avoid over excavation when trenching for proper key-in. Install the crown of the log to remain flush with the proposed grade, with zero void space between the end of the log and Channel Bed Material as depicted in the Contract Documents. Tie in all matting beneath and around the logs such that no loose edges are present and to the satisfaction of the Engineer.

#### **MEASUREMENT AND PAYMENT:**

Floodplain Grade Control Log Structure will be paid at the contract unit price per each structure installed that meets the material requirements. Payment will be for the entire structure regardless of the length or number of logs necessary to complete each structure. Logs will be harvested from logs on-site or off-site if on-site logs are inadequate in quantity/total length. Payment will be full compensation for furnishing, transport, installation, removal of excess materials, and all equipment and incidentals necessary to complete the work.

## SECTION 300 – PREFORMED SCOUR POOL

### Line Item 27: Preformed Scour Pool (EA)

#### DESCRIPTION:

This work consists of furnishing material and equipment for, and constructing preformed scour pools as detailed in the Contract Drawings.

#### MATERIALS:

Geotextile Class SE: Refer to the Channel Bed Material Special Provision.

MSHA Class III Riprap: Refer to the sizing specification outlined below:

<b>MSHA Riprap</b>	<b>D<sub>50</sub></b>	<b>D<sub>100</sub></b>
Class III	20 in.	28 in.

Sand and Gravel: Refer to the Sand and Gravel Special Provision.

#### CONSTRUCTION:

1. Prepare the subgrade for the scour hole to the required lines and grades. Subsoil will be placed according to the Contract Documents and Sections 702 or 703.
2. The rock must conform to the specified grading limits when installed in the scour hole.
3. Use Geotextile Class SE or better protected from punching, cutting, or tearing. Repair any damage other than an occasional small hole by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. Provide a minimum of one foot overlap for all repairs and for joining two pieces of geotextile. Embed the geotextile a minimum of 4 inches and extend the geotextile a minimum of 6 inches beyond the edge of the scour hole.
4. Stone for the scour hole may be placed by equipment. Construct to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. Deliver and place the stone for the scour hole in a manner that will ensure that it is reasonably homogenous with the smaller stones and spalls filling the voids between the larger stones. Place stone for the scour hole in a manner to prevent damage to the filter blanket or geotextile. Hand place to the extent necessary to prevent damage to the permanent works.
5. Place the stone for the scour hole so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

#### MEASUREMENT AND PAYMENT:

Preformed Scour Pool will be paid for at the Contract unit price per each structure installed. Payment will be full compensation for the preparation of surfaces, loading, hauling, stockpiling, placing, mixing, washing-in, and supplying and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Class SE Geotextile will not be measured and paid for separately and will be considered incidental to the Contract unit cost per each Preformed Scour Pool.

Furnished Sand and Gravel will be measured and paid for separately according to the Sand and Gravel Special Provision.

Salvaged Sand and Gravel will not be measured and is considered incidental to Class 5 Excavation.

## **SECTION 300 – CLAY CHANNEL BLOCK**

### **Line Item 28: Clay Channel Block (EA)**

#### **DESCRIPTION:**

This work consists of furnishing material and equipment for, and placing clay channel block material as detailed in the Contract Drawings.

#### **MATERIALS:**

Clay Channel Block Material. Must be unified soil. Classification SC or CL-ML and shall pass a minimum of 35 percent components through the #200 sieve. Material used for Clay Channel Block construction will be approved by the Engineer prior to use, including any alternative material not conforming to the Unified Soil Classifications listed above. The Fill Material shall be free of roots, stumps, wood, rubbish, stones greater than 6 in., as well as frozen and objectionable materials.

#### **CONSTRUCTION:**

1. Clay Channel Block shall be constructed as indicated on the plans with a minimum top width of 4 ft. The top elevation of the Clay Channel Block shall be no more than 6 in. (maximum) below the proposed ground surface. The Clay Channel Block shall extend at least 3 ft (minimum) below the existing ground surface (existing channel bed) and shall extend at least 3 ft (minimum) into the existing ground surface (existing channel banks) at the upstream and downstream ends.
2. Clay Channel Block material shall be placed in maximum 8 in. thick, pre-compaction layers, which shall be continuous over the entire length of the fill. Clay Channel Block material shall contain sufficient moisture such that the required degree of compaction shall be obtained with the equipment used. The "required degree of compaction" shall be understood to mean that, if the Fill Material is formed into a ball it shall not crumble and shall not be so wet that water may be squeezed from the material. Each layer of clay shall be compacted with construction equipment, rollers, or hand tampers to assure maximum compaction and minimum permeability, and will be approved by the Engineer at the time of construction.

#### **MEASUREMENT AND PAYMENT:**

Clay Channel Block will be measured and paid for at the Contract unit price per structure installed and approved. The payment will be full compensation for excavation, furnishing Clay Channel Block material, grading, preparation, installation, compaction, and disposal of excess material, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

## CATEGORY 400 – STRUCTURES (MSHA-BASED)

GENERAL NOTE: The referenced MSHA Sections and Subsections apply unless noted otherwise elsewhere in the Contract Documents. In case of conflict between MSHA specifications and other Contract Documents, the requirements of the other Contract Documents shall apply

### **SECTION 405 – REMOVAL OF EXISTING FOOTBRIDGES**

#### **Line Item 29: Removal of Existing Footbridges**

##### DESCRIPTION:

Comply with Subsection 405.01 of MSHA unless noted otherwise on Contract Documents.

##### MATERIALS:

Not applicable.

##### CONSTRUCTION:

Comply with Subsection 405.01 of MSHA unless noted otherwise on Contract Documents.

##### MEASUREMENT AND PAYMENT:

Comply with Subsection 405.04 of MSHA unless noted otherwise on Contract Documents

## CATEGORY 500 – PAVING (MSHA-BASED)

GENERAL NOTE: The referenced MSHA Sections and Subsections apply unless noted otherwise elsewhere in the Contract Documents. In case of conflict between MSHA specifications and other Contract Documents, the requirements of the other Contract Documents shall apply.

All work performed in the City Right of Way must be coordinated with, and inspected by, the City of Gaithersburg Public Works' Right-of-Way Inspector. Any defective work rejected by the Right-of-Way Inspector must be re-done at no additional cost to the City of Gaithersburg.

Unless otherwise described in each Line Item, in general, work performed under this Division is subject to inspection and acceptance by the Owner prior to payment. Any work not accepted must be re-done at no additional cost to the City.

### **SECTION 504 – HOT MIX ASPHALT PAVEMENT**

#### **Line Item 30: Hot Mix Asphalt Pavement 9.5MM (TON)**

##### DESCRIPTION:

Comply with Subsection 504.01 of MSHA unless noted otherwise on Contract Documents.

##### MATERIALS:

Comply with Subsection 504.02 of MSHA unless noted otherwise on Contract Documents.

Refer to the MSHA Standard Specification Sections 504 and 904 for applicable Quality Assurance and Material references. HMAs must be provided according to the following applications:

HMA – Surface Course (SC) for Driveways and Bike Paths: Superpave 9.5 mm, PG 64-22.  
HMA – Base Course (BC), all applications: Superpave 19.0 mm, PG 64-22.

##### CONSTRUCTION:

Comply with Subsection 504.03 of MSHA unless noted otherwise on Contract Documents.

The Contractor must protect the pavement against damage from all causes. Any part of the pavement that is damaged during construction must be repaired or replaced by, and at the expense of, the Contractor.

HMA pavement must be installed using the methods and equipment as specified in MSHA Section 504.03.01 unless noted otherwise.

#### **1. Base Course**

- a. HMA Base Mix must be spread on the stone sub-base as specified, by mechanical self-powered paver, true to line, grade, and cross-section. Screeding must follow to required level. Immediately after the screeding and before compaction, the surface must be checked, any irregularities adjusted, all accumulation from the screed removed by rake, and all flat spots replaced with satisfactory material.
- b. Compaction must be effected, while the mixture is still hot, by 10-ton tandem power roller. Rolling must start at the extreme lower elevation and proceed toward the higher elevation. Each successive trip of the roller must overlap  $\frac{1}{2}$  the side of the rear wheel of the roller. The

surface must then be subjected to rolling at right angles to the first rolling direction. Rolling must be continued until all roller marks are eliminated, and 92%-97% of the maximum theoretical density has been achieved.

- c. Any irregularities in the surface in excess of ¼ inch from the design grade when checked against the benchmark must be corrected. Should any irregularities remain after final compaction, the full depth of bituminous material will be removed and new material laid and compacted to form a true and even surface by the Contractor at no additional cost to the City.

## 2. Surface Course

- a. HMA Surface Mix must be spread on the asphalt concrete base course by mechanical pavers after making sure that: a) the base course surface is clean; b) the base course surface is dry; c) the temperature is above 40 degrees F; d) the base course surface meets the stipulated tolerance and thickness; and e) the base course was tacked before applying surface material.
- b. After spreading and screeding, compaction must commence with a steel wheel tandem roller weighing between 2 and 6 tons. The roller faces must be kept continually wet while rolling. The roller must not be operated at a speed exceeding 3 miles per hour. Rolling must be done in two directions, one at right angles to the other, until all roller marks are removed.
- c. The following tolerances must be met by the surface course:
  - i. The surface must not vary more than 1/8 inch from a planar surface when measure with a 10 foot straight in any direction.
  - ii. The surface must not vary more than ¼ inch from the proposed finish elevations at any location when checked against the benchmark.
  - iii. The finished slope must not vary more than 0.25% from the proposed slope in any direction.
- d. HMA Compaction: Compaction must be carried out in accordance with MSHA Standards and Specifications (2008), Section 504.03.06.
- e. Joints: Must be in accordance with MSHA Standard Specifications Section 504.03.07.
- f. Sampling and Testing: must be in accordance with MSHA Standard Specifications Section 504.03.10.

### MEASUREMENT AND PAYMENT:

Comply with Subsection 504.04 of MSHA unless noted otherwise on Contract Documents except delete Subsections 504.04.01, 504.04.02.

## **SECTION 508 – MILLING EXISTING HOT MIX ASPHALT PAVEMENT**

### **Line Item 31: Milling Existing Hot Mix Asphalt Pavement (SY)**

#### **DESCRIPTION:**

Comply with Subsection 508.01 of MSHA unless noted otherwise on Contract Documents.

#### **MATERIALS:**

Comply with Subsection 508.02 of MSHA unless noted otherwise on Contract Documents.

#### **CONSTRUCTION:**

Comply with Subsection 508.03 of MSHA unless noted otherwise on Contract Documents.

#### **MEASUREMENT AND PAYMENT:**

Comply with Subsection 508.04 of MSHA unless noted otherwise on Contract Documents.

## CATEGORY 700 – LANDSCAPING (MSHA-BASED)

**GENERAL NOTE:** The referenced MSHA Sections and Subsections apply unless noted otherwise elsewhere in the Contract Documents. In case of conflict between MSHA specifications and other Contract or Contract Documents, the requirements of the other Contract or Contract Documents shall apply.

Unless specifically specified otherwise in the individual Specification Sections below, the following minimum acceptance and maintenance requirements apply to all plant and seeding installations:

Initial Watering: The Contractor must provide at least one initial watering after planting, sodding or seeding. All watering must be accomplished using a hose with nozzle end breaker or a sprinkler. Water must be applied in sufficient quantities to maintain moist soil to a depth of at least 4 inches. Water must be applied at low water pressure directly to each plant, allowing water to be absorbed into the planting area until saturated, but without runoff. The Contractor must avoid the application of too much water.

The Contractor must water plantings as necessary until Initial Acceptance.

Contractor must be able to supply the required water from a water truck or from a nearby hydrant. When a hydrant is used, the Contractor is responsible for all regulations, permits or expenses necessary to use the public water supply.

Final Cleanup: Prior to Initial Acceptance, the Contractor must remove all trash and materials incidental to the project and dispose of it off-site. All rejected materials must be immediately removed from the site.

Inspection and Initial Acceptance: The Contractor must notify the Owner in writing that the Plantings, sod and/or seeds are installed in accordance with these specifications. The Contractor must request an inspection by the Owner. The inspection shall be performed by the Owner and Contractor within two weeks of written notification from the Contractor. If the installation and plantings are satisfactory, the Owner will provide a Certificate of Initial Acceptance to the Contractor. The Warranty period will begin from the date of the Certificate.

### WARRANTY (ESTABLISHMENT AND MAINTENANCE) PERIOD WORK

After Initial Acceptance of any Planting work, and before receiving complete payment for any planting installations, the Contractor must provide a written Warranty to the Owner for the planting work. The Warranty must be provided using the Owner's form or other form acceptable to the Owner. The Warranty must acknowledge the Contractor's responsibility to: establish and maintain all plantings, sodding, and/or seeding, and to replace all deficient work at the Contractor's sole cost. The length of the warranty will vary depending on the nature of the work; see the individual Specification Sections for information on Warranty length. Work to be performed during the Warranty period shall include, but not be limited to:

Maintenance Watering: The Contractor must provide sufficient watering as necessary to maintain the plantings, sodding, and/or seeding in good health throughout the Warranty period. This maintenance watering of planted trees, shrubs, herbaceous plants, sod, and/or seeded areas shall be as required for proper growth and health of the plantings. Water used on plants must be free of any substance harmful to the plants.

During the Warranty period, the Contractor must monitor the water needs of all plant material at least once per month between March 31 and October 31. Additionally, the Contractor shall perform more frequently water monitoring visits in periods of low rain (defined as any two-week period with less than an inch of rain at the Site). When the Contractor identifies the need for watering, the Contractor must notify the Owner of the timing of the Contractor's planned watering. After Owner notification, the Contractor shall proceed with its planned watering – whether the Owner attends the watering or not.

While the Owner has no obligation to monitor watering, the Owner may notify the Contractor if the Owner feels that the Contractor has failed to properly water plantings. If so notified, the Contractor must start watering within 24 hours of that notification. The Contractor must provide watering until all plant material has been properly watered as approved by the Owner. All required watering must be completed within five calendar days of Owner notification.

Contractor must be able to supply the required water from a water truck or from a nearby hydrant. When a hydrant is used, the Contractor is responsible for all regulations, permits or expenses necessary to use the public water supply.

Maintenance: The Contractor shall be responsible for all maintenance during the Warranty period including but not limited to: watering, invasive plant control, fence maintenance, stake and guy maintenance, and mowing (as applicable). See individual Sections for additional requirements.

Final Inspection: The Contractor will conduct a Final Inspection with the Owner at the end of each Warranty period. It will be the Contractor's responsibility to notify the Owner at least two weeks before the anticipated meeting. Any planting installation that does not meet the Contract Documents and/or the Warranty must be corrected or replaced by the Contractor at its own expense.

Replacements and Conditions: The Contractor must meet the required Warranties for replacement of deficient plantings. During the Warranty period, the Contractor will not be responsible for plant material that has been damaged due to vandalism, fire, relocation or other activities beyond the Contractor's control as determined by the Owner. The Contractor is responsible for maintaining adequate protection against deer (and other animal) damage, as specified in the specifications, during the Warranty period.

**The cost of the Planting Warranty work (including watering, maintenance, care and replacement) will not be paid for directly. Cost is incidental to other cost Line Items and Sections. If the Contractor fails to perform any Warranty work, the Owner has the right to perform the work and back-charge the Contractor.**

## SECTION 701 – TOPSOIL AND SUBSOIL

**Line Item 32: Furnish and Place Topsoil, 6 Inch Depth (SY)**

**Line Item 33: Furnish and Place Topsoil, 4 Inch Depth (SY)**

### DESCRIPTION:

Comply with Subsection 701.01 of MSHA unless noted otherwise on Contract Documents.

This work consists of providing and installing topsoil over prepared subsoil prior to establishment of vegetation.

### MATERIALS:

Comply with Subsection 701.02 of MSHA unless noted otherwise on Contract Documents.

The topsoil must be in accordance with MSHA Section 920.01.02 and must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Soils having low moisture content, low nutrient levels, low pH, materials toxicity to plants, and/or unacceptable soil gradation are not acceptable. Topsoil must not be a mixture of contrasting textured subsoils, and shall contain less than 5 % by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 " in diameter.

**Maximum sand content in topsoil shall be 50%.**

### CONSTRUCTION:

Comply with Subsection 701.03 of MSHA unless noted otherwise on Contract Documents.

Topsoil must be placed according to the Contract Documents. Thirty days prior to installation, the Contractor must provide the Owner with a soil test report from an accredited soils testing lab for the existing subsoil on site and a soils report for all to-be supplied topsoil. The soil test must verify the material is in accordance with MSHA section 920.01.02. Only topsoil meeting MSHA section 920.01.02 (and Contract limit on sand content) can be applied according to the Contract Documents.

Where the subsoil is either highly acidic or composed of heavy clay, ground limestone must be spread according to the soil test results, or if not specified, at the rate of 4-8 tons/acre (200-400 lbs per 1000 sq ft) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil. Topsoil shall be tested and amended as per soil test recommendations.

During installation, topsoil must be uniformly distributed in a 6-8 inch layer and lightly compacted to a thickness of 4 inches to meet proposed grades shown on the Contract Documents. Any irregularities in the surface resulting from the installation of topsoil or other operations must be corrected in order to prevent the formation of water pockets or depressions. The Contractor must minimize soil compaction during installation and avoid applying topsoil on frozen, muddy or other conditions that may be detrimental to proper grading and seedbed preparation. All necessary erosion and sediment control practices must be maintained as required by the City.

Temporary stockpiling and replacement of local top soil on a construction site will be covered under Excavation.

### MEASUREMENT AND PAYMENT:

Furnish and Place Topsoil, 4-inch depth shall be paid at the Contract unit price per square yard for area actually covered. Payment will include transport of materials to the site, stockpile, and installation of topsoil, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

Furnish and Place Topsoil, 6-inch depth shall be paid at the Contract unit price per square yard for area actually covered. Payment will include transport of materials to the site, stockpile, and installation of topsoil, and for all materials, labor, equipment, tools, and incidentals necessary to complete the work.

## SECTION 704 – TEMPORARY SEED

### Line Item 34: Temporary Seeding (SY)

#### DESCRIPTION:

Comply with Subsection 704.01 of MSHA unless noted otherwise on Contract Documents.

This work consists of establishment of temporary ground cover as specified in the Contract Documents.

This subsection also includes the installation of mulch or wood chips (with a maximum chip size of 2 inch in any dimension) to protect soil and/or for root protection.

#### MATERIALS:

Comply with Subsection 704.02 of MSHA unless noted otherwise on Contract Documents.

Seed must be fresh, clean, and a new seed crop composed of the following varieties mixed in the proportion shown:

Temporary Seed Mix – 100% Cereal Rye or 100% Annual Ryegrass

Straw must meet the specifications in MSHA Section 920.04.01.

#### CONSTRUCTION:

Comply with Subsection 704.03 of MSHA unless noted otherwise on Contract Documents.

Acceptance of Newly Seeded Areas: Areas with temporary seeding must meet the approval of the Owner and all regulatory agencies (including the sediment control inspector). The Contractor must schedule all initial and follow up regulatory inspections required by the inspectors in a timely manner.

The Contractor shall submit a request for Owner Acceptance when at least 90 percent of the surface has germinating grass. An inspection will be conducted to verify completion. Acceptance will be granted when at least 90 percent of the surface has germinating grass. As needed, the Contractor shall perform overseeding, at its sole cost, to obtain the 90% grass coverage.

Watering to develop and maintain a good stand of grass, must be provided as described in Category 700 until Acceptance by the Owner and all regulatory agencies.

Mulch: Install wood chips or mulch to a minimum depth of 6 inch as needed in disturbed areas. Chips/mulch shall be assumed to be obtained off-site but, as available can be generated by on-site clearing. Mulch placed beside an existing paved trail will be a minimum of 5 feet wide. When stabilizing an area for a week or longer, the Contractor must grade out ruts and low spots on a daily basis on all access ways and replenish access as required. Upon completion of construction activities, materials must be removed.

#### MEASUREMENT AND PAYMENT:

Temporary Seeding shall be measured and paid at the at the Contract unit price per square yard. Payment shall be full compensation for furnishing and incorporating seed including all, materials, labor, equipment, tools, maintenance and incidentals necessary to complete the work as specified in the Contract Documents.

The installation of mulch or wood chips shall not be measured and will be considered incidental to the Contract unit price for Temporary Seeding.

## SECTION 707 – PERMANENT SEEDING

**Line Item 35: Permanent Seeding – Wetland Seed Mix (SY)**

**Line Item 36: Permanent Seeding – Riparian Seed Mix (SY)**

**Line Item 37: Permanent Seeding – Turf Grass Seed Mix (SY)**

### DESCRIPTION:

Comply with Subsection 707.01 of MSHA unless otherwise noted on Contract Documents.

This work consists of soil preparation, seeding, mulching, and overseeding (as necessary) for all areas designated to receive herbaceous permanent seeding as specified in the Contract Documents or as directed by the Engineer. This will include all specified permanent seed mixes as depicted in the Contract Documents. These seed mixes shall supersede the use of any mixes specified in the Erosion and Sediment Control Plan.

### SUBMITTALS:

All submittals from the Contractor must be in writing. All approvals from the Engineering Consultant must be in writing (email or letter) in order to be valid. Work must not be performed until the Engineering Consultant provides approval. Submittals for other specification sections, referenced in this Section, must also be made. All submittals must be on time, complete, and include all information required below unless waived by the Owner in writing.

1. Within sixty days of Notice-to-Proceed, or six months prior to the start of seeding (whichever date is later), the Contractor must submit the proposed seed supplier and source information. All of the below items must be approved by the Owner prior to purchase and mixing of seed:
  1. Seed supplier/s, including name, address, and contact email and phone number
  2. Seed source/s, including the state and county in which each species of seed was, or will be collected
  3. Written Notice from the Contractor if the Contractor feels that the seed mix cannot produce a stand of vegetation that will meet these specifications; the Contractor must state its reason in writing
  4. Requests for Substitutions, if necessary, in accordance with the General Conditions of Construction Contract
2. At least one month prior to the Contractor's scheduled seeding date, the Contractor must submit results of a lab analysis of the seed. The analysis must be performed according to the Association of Official Seed Analysts (AOSA) current standards at a laboratory with an AOSA Certified Seed Analyst and must have been performed within six months preceding the scheduled seeding date. Analysis must include the following for each species in the seed mix:
  1. Purity composition
  2. Percentage occurrence of noxious weed seeds
  3. Percentage germination of the pure seed
  4. Percentage dormancy of the pure seed
3. At least one month prior to the Contractor's scheduled seeding date, the Contractor must submit a seeding schedule and seed information which includes the following:
  1. Adjusted application rates, by weight, necessary to meet the 100% pure live seed (PLS) content for each seed mix
  2. Total quantity, by weight, proposed for each seed mix
  3. Itemization by weight and approximate seed count for each species used in each seed mix

4. Data must be submitted for each species stating whether the seed has been stratified, scarified, and/or inoculated with nitrogen-fixing bacteria [For Spring planting, it is preferable for seeds to be cold stratified.]
4. At least one week prior to the proposed seeding date, the Contractor must submit and receive approval from the Engineering Consultant of the proposed cover crop species and cover crop seed application rate.
5. If the Contractor feels that fertilizer or other amendments are necessary to achieve an approved stand of vegetation, the Contractor must submit a soil analysis conducted according to MSHA Section 920.01, including textural classification, pH, organic matter, nutrient content, and soluble salts. The Contractor must submit recommended product specifications and application rates. Soil analysis and recommendations must be submitted at least one week prior to seeding.
6. Before seed is applied to the site, the Contractor must provide the Owner's Site Construction Representative with seed tickets for all seed to be used. The seed tickets must include the botanical names of the species in the mix/es, including both genus and species.
7. The Contractor must notify the Engineering Consultant and the Owner (via e-mail) at least 48 hours in advance of each day that seed will be applied so that seed and the seed bed may be inspected for approval. The Contractor must not apply seed until the seed and seed bed have been inspected and approved by the Engineering Consultant or the Owner.
8. Within one week following seeding, the Contractor must submit a data log for each day that seed was applied, documenting the following:
  1. Seed mix/es planted
  2. Quantity, by weight of seed mix/es used, for each day seed was planted
  3. Method used for applying seed
  4. Method used to compact seedbed after seeding
  5. Type of soil protection (mulch or matting) used
  6. Description or graphical depiction of areas that were seeded each day
9. The Contractor must request (in writing) an inspection for Initial Acceptance. If phased Initial Acceptance has been approved, a request for inspection must be made for each phase of seeding. If Initial Acceptance is not provided, the Contractor must request subsequent inspections until the Initial Acceptance requirements are met.
10. Warranty: After the Contractor receives a Certificate of Initial Acceptance from the Owner, the Contractor must submit a written Warranty covering the establishment and maintenance of meadow seeding. The Warranty period shall begin from the date of the Certificate of Initial Acceptance.
11. The Contractor must submit any items applicable to maintenance and care performed during the Warranty period on the site according to the appropriate sections.
12. The Contractor must request (in writing) an inspection by the Engineer and the Owner for Final Acceptance. If Final Acceptance is not provided, the Contractor must request subsequent inspections until the Final Acceptance requirements are met.

#### MATERIALS:

1. The Contractor shall furnish the specialized permanent seed mixes as specified on the Contract Documents.

2. Seed must be fresh, clean, new seed composed of the species specified and meeting the requirements of these specifications.
3. The original source of seed must have been collected from within 300 miles of Montgomery County, Maryland in the Piedmont region, unless otherwise approved by the Engineering Consultant or the Owner.
4. The Contractor shall apply specialized herbaceous seed mixes at the rates specified in the Contract Documents. All seed shall have a minimum purity of 98% and a minimum germination of 85% per planting zone. The seed mix is to be endophyte-free and contain less than 1% inert matter.
5. Seed must meet Maryland and Federal seed laws, including maximum allowable percentages of noxious weed seeds.
6. Cover crop seed species and application rates must be in accordance with those recommended by the 2011 (or current version) Maryland Department of the Environment's "Standards and Specifications for Soil Erosion and Sediment Control"; Table B.1, unless otherwise specified in the Contract Documents or approved by the Owner.
7. The Contractor shall apply amendments at the rates specified in the Contract Documents or as recommended by the manufacturer. The cost will be considered incidental to this Section.

#### CONSTRUCTION:

If the Contractor fails to make submittals on time or does not meet the requirements for seed approval by the time permanent seeding is required, the Contractor must stabilize the site, at no cost to the Owner, until submittals are made and the seed approval requirements are met.

By seeding, the Contractor is accepting the seed mix as being able to produce an approved stand of vegetation.

1. All areas disturbed by construction must be seeded in accordance with the Contract Documents, the Engineering Consultant, or the Owner. Areas not disturbed must not be seeded, unless otherwise specified on the Contract Documents or directed by regulatory agencies, the Engineering Consultant, or the Owner.
2. As required, topsoil must be installed according to:
  - a. Topsoil Section 701 and
  - b. Specifications on the Contract Documents, or
  - c. MSHA Subsection 920.01, if topsoil requirements are not specified in the documents above.
3. All areas to be seeded must conform to the finished grades as specified on the Contract Documents and must meet the following requirements:
  - a. Be free of all weeds, trash, debris, brush, clods, stones and other foreign materials larger than two and a half inches (2 ½") in diameter or length that would interfere with seeding.
  - b. All gullies, washes or disturbed areas that develop subsequent to final grading must be repaired prior to seeding.
4. Prior to seeding, the seeding surface must be raked to a uniform and friable finish. No

fertilizer or soil amendments may be used without prior written approval of the Engineering Consultant or the Owner.

5. Topsoil or compost that has been heavily compacted must be loosened or otherwise worked to a depth of 4 inches before planting. If standing water is present, the Contractor must pump down the water according to the City of Gaithersburg Erosion and Sediment Control requirements. No standing water must be present before and during seeding
6. No seeding may be performed when temperatures are 32 F or below, before heavy rain, on frozen ground, on soil where standing water is present, or on soils which lack sufficient soil moisture to provide seed/soil contact. If soils lack sufficient soil moisture, the Contractor shall wet the soils to prior to seeding.
7. Final grade, seedbed, and seed must be inspected and approved by the Engineering Consultant or the Owner on each day seeding is performed. If final grade, seedbed, or seed is rejected by the Engineering Consultant or the Owner prior to seeding, the Contractor must stabilize the site at no cost to the Owner until each of these items is approved. If the Contractor performs seeding without approval, the Engineering Consultant or the Owner may require the Contractor to remove the seedbed and any seed applied, and reconstruct the seedbed and reseed at no additional cost to the Owner. Seeding must be done immediately after seed and seedbed acceptance by the Engineering Consultant or the Owner. Seed mix/es being planted must match the approved mix/es in the Contract Documents or include only previously approved Substitutions. If seed tickets do not match the approved mix/es, the Contractor will be required to stabilize the site, at no additional cost to the Owner, until an approved seed mix is provided.
8. Seeding must be accomplished by using a broadcast spreader, capable of placing seed at the specified rate or spread by hand. Other methods of seeding may be allowed only if approved by the Engineering Consultant at least one month prior to seeding, but shall be at no additional cost to the Owner. All seeding equipment must be calibrated before application to the satisfaction of the Engineering Consultant or the Owner so that the materials are applied accurately and evenly to avoid misses and overlaps. Seed must be applied within the top 1/4" of the soil in two different directions. After application, the seed must be raked into the soil. Sand or other inert material may be mixed with the seed to aid in even application.
9. Immediately following seed application, the Contractor must use a water filled roller with a weight of approximately 40 pounds per linear width, cultipacker, or similar equipment over all seeded areas to maximize the seed/soil contact by firming soil around the seed. Do not perform rolling when soils are saturated.
10. The Contractor must place and secure erosion control matting or another approved form of soil protection after seeding and will be paid for under the applicable unit cost line item.
11. Any areas, in which the soil is disturbed after seeding but prior to Initial Acceptance, must be reseeded following the full requirements of this specification section.
12. Initial Watering shall be done per Category 700 requirements. After the Initial Watering, watering shall be done only to the extent that the Contractor must water seeded areas in order to meet Initial and Final Acceptance requirements. If watering is performed, it must be in accordance with the Category 700 requirements, at no additional cost to the Owner.

## INITIAL ACCEPTANCE:

The Contractor must request inspection of seeding by the Engineering Consultant and the Owner for Initial Acceptance. Initial Acceptance of seeding will be made after seed has germinated and sprouted sufficiently to provide ground cover so that, for any given 1000 square foot area, there is at least 95 percent coverage of the ground and no bare ground areas larger than 16 square feet. Coverage may consist of the cover crop species. Deficiencies in seeding must be corrected prior to Initial Acceptance.

The Owner will provide the Contractor with a Certificate of Initial Acceptance dated for when all Initial Acceptance requirements were met. Retroactive Initial Acceptance will not be given. If Initial Acceptance requirements are not met, the following corrective measures must be used until the required ground coverage is met:

1. Flooded, washed-out, rilled or otherwise damaged or defective areas of seeding, grade, swales or berms must be reconstructed and all grades re-established in accordance with the grading plans or other applicable specifications.
2. For any area 1000 square feet or larger that has less than 40 percent coverage, the Contractor must re-stabilize and reseed following the full application process in these specifications for seedbed preparation and seeding.
3. For any area 1000 square feet or larger that has between 40 and 94 percent coverage, and for any bare ground areas 16 square feet or larger, the Contractor must rake the soil, over-seed, and re-mulch.

If the Contractor wishes to phase Initial Acceptance based on differing seeding dates, the Contractor must submit a proposal for phased Initial Acceptance to the Engineering Consultant and the Owner for approval at least one week prior to the first requested Initial Acceptance inspection. The proposal must include:

1. A graphic plan showing all proposed phases
2. Estimated dates of seeding for each phase.

## WARRANTY

1. The Contractor must provide and maintain a two-year, 85% survival rate per 1000 square feet area, care and replacement warranty on all seeding. The length of the Warranty shall be two years from the date of Initial Acceptance. The Warranty must guarantee that Final Acceptance requirements will be met. The Contractor must reseed all areas experiencing less than an 85% survival rate.
2. The Warranty period shall begin upon the date of the Certificate of Initial Acceptance.
3. As necessary, the Contractor must perform work to meet Final Acceptance requirements at its sole cost.

The Warranty may be phased according to phasing of Initial Acceptance.

## MAINTENANCE:

The maintenance period shall extend until Final Acceptance.

The Contractor is responsible for reseeding all areas experiencing less than the required coverage rate. Reseeding must include all materials, incidentals, fees, permits, and access arrangements necessary

for reseeding, at no additional cost to the Owner. All submittals pertinent to this specification except for the Warranty must be provided for reseeding.

1. For any area 1000 square feet or larger that has less than 40 percent coverage, the Contractor must re-stabilize and reseed following the full application process in this specification section for seedbed preparation and seeding.
2. For any area 1000 square feet or larger that has between 40 and 85 percent coverage, and for any bare ground areas 16 square feet or larger, the Contractor must over-seed according to this specification section to achieve Warranty coverage.

Watering shall be done to the extent that the Contractor must water seeded areas in order to meet Final Acceptance requirements. If watering is performed, it must be in accordance with the Category 700 requirements, at no additional cost to the Owner.

#### FINAL ACCEPTANCE:

The Contractor must request inspection by the Engineering Consultant and the Owner for Final Acceptance. Final Inspection for Meadow Seeding Warranty shall occur at the end of the Warranty period. Final Acceptance for Permanent Seeding will be provided if there is adequate vegetative coverage over the seeded area. If the stand does not meet these conditions, seeding and care must continue until the following conditions for Final Acceptance are met:

1. Any given 1000 square foot area must have a minimum ground coverage of 85%.
2. There must be no bare ground areas larger than 16 square feet.
3. Ground coverage must be comprised of the species specified.
  - a. At least 60% of ground coverage must be from species in the meadow seed mix and/or species native to Montgomery County as illustrated in the Biota of North America Program's North American Plant Atlas. Cover crop species will not count toward this ground coverage.

For the purpose of Final Acceptance, the stand may be subdivided into distinct stands only if a stand is separated from another stand by 50 feet or more, if a stand is in wetland conditions (continuously submerged under water), if a stand consisted of a different seed mix, or if a stand is being inspected in a different year. If the stand does not meet the above conditions at the time of inspection, maintenance and care must continue until the conditions for Final Acceptance are met.

#### MEASUREMENT AND PAYMENT:

Permanent Seeding, including applying furnishing and incorporating all seed mixes, soil preparation, fertilizer, seeding, over seeding (if necessary), mulch, and watering will be measured and paid for at the Contract unit price per square yard of seed applied. Payment is full compensation for furnishing, installation, Warranty and maintenance, including all materials, labor, equipment, tools, and incidentals necessary to deliver in accordance with the Contract Documents.

The cost of all Warranty and maintenance work is incidental to the Unit Price; the Contractor shall perform all Warranty and maintenance work at no additional cost. If the Contractor fails to perform any Warranty and/or maintenance work, the Owner has the right to perform the work and back-charge the Contractor.

## **Section 700 – FLOODPLAIN MATTING (COIR 1000 OR SIMILAR)**

### **Line Item 38: Floodplain Matting (Coir 1000 or similar) (SY)**

#### **DESCRIPTION:**

Place floodplain matting according to Contract Documents or as otherwise directed by the Engineer.

#### **MATERIALS:**

Floodplain Matting: Floodplain matting shall be Nedia KoirWrap 1000 type matting or an approved equivalent machine produced matting. Alternatively, two types of biodegradable erosion control matting consisting of an outer layer of high strength, continuously woven coir matting, and an inner layer of lightweight jute fabric may be utilized. However, in this case the two layers of matting will need to be sewn together at appropriate intervals with biodegradable thread at the direction of the Engineer. Matting must be approved by the Owner.

#### **CONSTRUCTION:**

1. Furnish the Engineer with specifications and a source of coir 1000 matting for review and approval.
2. Complete topsoil and permanent seeding before the coir 1000 matting is installed. Place the matting no later than 24 hours after seeding operations have been completed. Lay matting smoothly upon the seeded bed in the direction of water flow. Avoid stretching.
3. Overlap the ends of each strip at least 2 ft for both vertical and horizontal overlaps where more than one width of matting is required. Overlap so that the higher mat overlaps the lower mat, and the upstream matting overlaps the downstream matting. Firmly fasten matting in place with anchor stakes.
4. Place anchor stakes a maximum of 3 ft apart and throughout the matting. Place anchor stakes no greater than 18 in. apart on all overlapping edges. Place anchor stakes no greater than 18 in. apart at all ends of matting.
5. Key-in matting and place as shown in the Contract Drawings. The Contractor shall excavate a trench along all edges of the matting to a depth of 6 in. to tie-in into existing ground as shown in the Contract Documents. The matting shall be placed into the trench and secured with anchor stakes as described above. After completion of staking, the trench shall be backfilled and tamped.

#### **MEASUREMENT AND PAYMENT:**

Floodplain Matting will be measured and paid for at the Contract unit price per square yard of finished area actually covered that meets the material requirements. The payment will be full compensation for furnishing, grading, placing, trench excavation and backfilling, anchor stakes, and fastening or pinning the mats, and for all material, labor, equipment, tools, and incidentals necessary to complete the work.

**SECTION 709 – TYPE D SOIL STABILIZATION MATTING**

**Line Item 39: Type D Soil Stabilization Matting (SY)**

**DESCRIPTION:**

Comply with Subsection 709.01 of MSHA unless noted otherwise on Contract Documents.

This work shall consist of furnishing, placing and securing natural fiber matting along bank treatment areas and other areas of the site, as specified in the Contract Documents or as directed by the Engineer. This work will occur on all graded slopes and is to extend a set distance beyond the top of bank as shown on the Contract Documents or to the Limits of Disturbance, whichever comes first.

**MATERIALS:**

Delete Subsection 709.02 of MSHA.

Type D Soil Stabilization Matting: Matting for the bank treatment areas shall consist of a machine produced mat of degradable natural fibers and shall meet the following minimum specifications:

Material:	Woven coir fiber yarn or twine
Thickness:	0.25 in.
Elongation (Dry/Wet):	29%/35%
Weight:	20 oz/SY
Open Area:	50%
Size:	6 ft. wide X 150 ft in length (100 SY per roll)
Flow Velocity:	8 ft./sec.
Life Expectancy:	3 years

Anchor Stakes: Stakes for securing the matting shall be tapered two foot long wooden stakes consisting of standard 2 in. by 4 in. wooden boards cut diagonally. Staples of any kind shall not be permitted.

**CONSTRUCTION:**

Comply with Subsection 709.03 of MSHA except as noted below and noted otherwise on Contract Documents.

Where more than one width of matting is required, the ends of each strip shall overlap as specified on the Contract Drawings. Overlapping shall be done with both the upslope and upstream ends of the matting overlapping the down slope and downstream ends. Matting shall be installed as depicted on the typical details to the limits of grading shown on the cross sections. In no case shall matting extend less than 24 inches beyond the top of the slope.

Keying-In: The Contractor shall key-in matting to the finish grade as specified in the details on the Contract Drawings. Following installation of Matting Stakes or staples, disturbed soils adjacent to matting shall be tamped firmly such that soils and matting are neither mounded nor gullied leaving an even surface with surrounding areas. The Engineer may require any other edge of matting exposed to more than normal flow of water to be keyed-into the slope in a similar manner.

Securing Matting with Stakes: Matting shall be securely fastened in place with Anchor Stakes hammered vertically into the soil. The stakes shall be installed no greater than 1 1/4-inches above the ground and matting surface. Installation in soils that contain stream cobbles might require use of pilot holes made with rebar or digging bar before installing wood stakes.

Anchor Stakes shall be installed a maximum of 3 ft. apart in alternating rows. Anchor Stakes shall be installed 1.5 ft. apart along the upstream and downstream overlapping edges of the matting, and within the key-in trench at the top of slope. The Contractor shall excavate a trench along all finished edges of the matting to a depth of 6 in. The matting shall be placed into the trench and secured with Anchor Stakes as described above. After completion of staking, the trench shall be backfilled and tamped.

#### MEASUREMENT AND PAYMENT:

Type D Soil stabilization matting will be measured and paid for at the Contract unit price per square yard of finished area actually covered that meets the material requirements. The payment will be full compensation for all material, labor, equipment, tools, and incidentals necessary to complete the work.

Anchor Stakes will not be measured and paid for separately and will be considered incidental to the Contract unit price per square yard of Type D Soil Stabilization Matting.

## SECTION 710 – TREE, SHRUB, AND WETLAND PLANTING

- Line Item 40: Emergent Wetland Plugs (EA)**
- Line Item 41: Deciduous Canopy Trees (EA)**
- Line Item 42: Deciduous Understory Trees (EA)**
- Line Item 43: Evergreen Trees (EA)**
- Line Item 44: Shrubs (EA)**

### DESCRIPTION:

Work under this specification section includes, but is not limited to, installation of trees, shrubs, perennials, vines, and grasses in accordance with MSHA 710 and ANSI Z60.1 “American Standard for Nursery Stock”, except as noted otherwise on Contract Documents.

Comply with Subsection 710.01 of MSHA unless noted otherwise on Contract Documents.

### SUBMITTALS:

This subsection lists submittals required as part of this specification section.

All submittals from the Contractor must be in writing in accordance with Section C (Summary of Required Material and Submittal Certifications) of Category 000 – General Requirements, References, and Specifications. All approvals from the Engineering Consultant must be in writing (e-mail or letter) in order to be valid. Work must not be performed until the Engineering Consultant provides approval. Submittals for other specification sections, referenced in this Section, must also be made. All submittals must be on time, complete, and include all information required below unless waived by the Owner in writing.

1. Qualification Data: Submit qualifications of the Landscape Foreman verifying years of experience installing trees and shrubs a minimum of one month prior to planting. Resubmit qualifications to the Owner for any new Landscape Foreman.
2. Plant Records: Submit the following information a minimum of one month prior to planting. The Contractor must resubmit any proposed changes after the initial submittal.
  - a. Plant schedule listing species by botanical name, including genus and species, and if applicable, variety or cultivated variety. Quantities for each species, variety, and size must be provided.
  - b. Name(s) and contact information of proposed supplier(s)
  - c. If applicable, any requests for Substitution, in accordance with the General Conditions of Construction Contract, including an explanation of why a species is not obtainable and identifying five suppliers that were checked for availability
  - d. If available, the location of initial source of origin (seed source)
  - e. If available, the method of propagation (from seed, grafting, cutting, etc.)
3. Request for Plant Inspection: Submit Request for Plant Inspection to the Engineering Consultant and Owner a minimum of two weeks prior to proposed delivery of plants to the site so that plants may be inspected/selected at the nursery or holding area. If plant availability is phased/grouped, a Request for Plant Inspection must be submitted for each phase/group.
4. Delivery Notification: Submit to the Engineering Consultant and Owner, the time and date of proposed delivery of plants to the site a minimum of two business days prior to each delivery.

5. List of Rejected Plants: The Contractor must submit to the Engineering Consultant and Owner a list of any plants rejected and removed from the site, prior to Initial Acceptance of Plantings.
6. Installation Phase Watering Records: The Contractor must submit to the Engineering Consultant and Owner a report of watering performed within 7 days of each watering event for six weeks following planting. The report must include:
  - a. Date/s that watering was performed
  - b. Areas that were watered
  - c. Quantity, in gallons, of water used for each watering event
7. Watering Waiver Request: If the Contractor desires a waiver from any watering event in the first six weeks after planting, the Contractor must submit a request to the Engineering Consultant and Owner prior to the scheduled watering event. The request must include the following:
  - a. Date/s that rain occurred at the site
  - b. Quantity of rain, in inches, that occurred at the site
  - c. Source of rainfall dataThe Contractor may skip a watering event only if approved in writing by the Engineering Consultant or Owner.
8. Initial Acceptance: The Contractor must submit a written request for Initial Acceptance to the Engineering Consultant and Owner upon completion of planting and associated work. If the Contractor wishes to phase Initial Acceptance, a request must be submitted prior to the first Initial Acceptance inspection. A separate request must be submitted for each inspection.
9. Maintenance Requests: The Contractor must request and obtain approval from the Owner for the use of any herbicide on the site and for any watering performed after the 6-week Installation Phase watering period.
10. Monitoring/Maintenance Reports: The Contractor must submit monthly reports to the Engineering Consultant and Owner detailing monitoring and maintenance tasks performed on the site during the Warranty period. Reports must be submitted within one week of the monitoring/maintenance event and must include the following information:
  - a. Date/s that monitoring was performed
  - b. Quantity and identity of deficient plants on the site
  - c. Repair work performed on deer protection or guying and staking
  - d. Remulching performed
  - e. If watering was performed, provide any submittals required under Category 700.
11. The Contractor must submit a list of plants removed and replaced during the warranty period, including the date/s removal/replacement was performed. List/s must be submitted within one week of removal and/or replacement.
12. Final Inspection and Acceptance: The Contractor must submit a written request to the Engineering Consultant and Owner for Final Acceptance upon completion of Final Acceptance requirements.
13. The Contractor must submit a report documenting any work performed after Final Inspection, including all items necessary to meet Final Acceptance.

#### MATERIALS:

The Contractor is responsible for furnishing and installing all plants shown on the Contract (or Contract) Documents. The Contractor must verify the availability of all plant types and quantities to its own

satisfaction prior to bidding. Any problems with delivering the specified plants must be reported to the Engineering Consultant and Owner immediately (and in no case less than one month before scheduled planting). The plants must meet the requirements under this Materials section.

Plant Source:

1. All plants must originate from within 100 miles of Montgomery County. Preference should be given to plants originating in the Piedmont region.
2. Plants must have been nursery grown within U.S.D.A. plant hardiness zones 6 or 7.
3. Substitutions will only be permitted under the requirements of the General Conditions of Construction Contract including a written explanation for why a specified plant is not obtainable. The explanation must include a list of at least five suppliers that were checked, which typically carry the species. The written request must be submitted to the Engineering Consultant and Owner a minimum of one month prior to scheduled installation. Any Substitutions shall be at no additional cost to the Owner.
4. A copy of the State Department of Agriculture Nursery Inspection Certification, from all nurseries supplying plant material, must be submitted to the Engineering Consultant and Owner upon request.

Plant Quality Assurance:

1. All plants must comply with ANSI Z60.1 "American Standard for Nursery Stock" approved April 14, 2014 or the most recent edition, unless noted otherwise on the Contract (or Contract) Documents.
2. All plants must be true to species, variety, and cultivated variety (cultivar) as specified on the Contract (or Contract) Documents or by the Owner. If a cultivar is not specified, a cultivar must not be used. Plants must have normal growth form and characteristics for the species.
3. All trees must be single stem/trunk unless otherwise specified on the Contract (or Contract) Documents.
4. All plants must be well formed, vigorous, healthy, well branched; and, when in leaf, actively growing and densely foliated with leaves of normal size, color, and density.
5. All plants must have healthy, well established root systems proportionate in size to the top. Roots must reach the sides of the container and must be sufficient to hold soil intact.
6. All plants must be free from disease and insect pests, and from insect pest eggs and larvae.
7. All plant containers must be free of invasive weed species.
8. All plants must be container established or freshly dug, balled and burlapped, unless otherwise noted on the Contract (or Contract) Documents. No stock that has been placed in cold storage or collected will be accepted.
9. All plants must not have extra soil above the root ball.
10. Trees must not be root bound. Spiraling roots, root curl, and any other type of deformation of the roots will not be accepted.

11. Trees must have straight trunks, with a single leader that is well branched, intact, undamaged, and uncut; unless otherwise noted on the Contract (or Contract) Documents.
12. Trees cut back from larger grades to meet requirements will not be accepted. Trees must not be top pruned in any way except to remove damaged branches or structural problems.
13. Trees shall not at any time be bent, bound, or tied with wire, rope, or plastic in a manner that may damage bark or branches, or destroy the natural shape.
14. Trees must be free of physical damage, including unhealed branch removal wounds greater than 1-inch diameter, wounds or scars caused by sunscald, abrasions, disfiguring knots, staking, wire, ties, or any other defect which could cause structural failure or disfigurement.
15. Synthetic or otherwise non-biodegradable burlap must not be used for balled and burlapped stock.

#### Inspection:

The Contractor must submit a Request for Plant Inspection to the Engineering Consultant and Owner a minimum of two weeks prior to proposed delivery of plants to the Site. If plant availability is phased/grouped, a Request for Plant Inspection must be submitted for each phase/group. The Engineering Consultant or Owner will determine where to inspect plants: at the nursery, holding area, or the site. The Engineering Consultant or Owner may request notification of when delivery of plants will be made to the nursery or holding area, and may request to be on Site at the time of delivery. Any plants rejected at the nursery or holding area must not be delivered to the Site. Inspection and approval of plants at the nursery or holding area does not exempt them from rejection at the Site. The condition and identity of plants will be subject to re-inspection for the duration of the Contract (or Contract) and Warranty period.

#### Delivery:

The Contractor must submit to the Engineering Consultant and Owner, the time and date of proposed delivery of plants to the Site a minimum of two business days prior to each delivery. Prior inspection at the nursery or holding yard does not relieve the Contractor from this requirement. All plants delivered to the Site must be unloaded, inventoried and grouped by plant species and size under the direct supervision of the Landscape Foreman. The Engineering Consultant or Owner must approve the delivery with the Landscape Foreman present and all signed delivery tickets, matching the approved delivery, must be provided to the Owner upon receipt of the delivery. The Site may not be used as a holding area for plants that will not be planted at the Site.

#### Handling:

1. In transit, all plants must always be covered with a tarp.
2. The rootballs of the plants delivered must be moist and kept moist until planted.
3. Plants not installed the day of delivery must be properly stored and protected from direct sun, cold temperatures, wind, wildlife, and vandalism. Damaged plants or plants grazed by wildlife will not be accepted. Plants must not be stored on the Site for more than one week.
4. Plants must not be dropped or handled by the trunk, stems, or foliage.

5. Plant stems must be protected from being damaged, scarred or broken while being handled, stored and transported by equipment.

Rejection:

Any materials and/or work may be rejected by the Engineering Consultant or Owner if the plants do not meet these specifications. All rejected plants must be removed from the site by the Contractor within 48 hours. All rejected plants must be documented by the Landscape Foreman and a copy listing the rejected plants must be provided to the Engineering Consultant and Owner prior to Initial Acceptance.

INSTALLATION:

If the Contractor fails to make submittals and meet approvals on time and/or does not have approved plants by the time planting is required, the Contractor must stabilize the site, at no cost to the Owner, until submittals are made and approved and plants are approved.

By planting, the Contractor accepts that the plants are warrantable under the site conditions.

Installation of plants must be performed according to the following:

1. Personnel: The Landscape Foreman must have 5 years or more documented successful experience in native plant landscape installation. Submit qualifications of the Landscape Foreman verifying years of experience installing trees and shrubs. Qualifications must be submitted to the Owner a minimum of one month prior to planting. Resubmit qualifications to the Owner for any new Landscape Foreman. All work must be performed by personnel experienced with the planting procedures and under the direct supervision of the approved Landscape Foreman.
2. Timing: Unless otherwise directed by the Engineering Consultant or Owner, trees and shrubs must be planted between September 1 and May 15. No planting in stream or immediately adjacent to the stream channel during the Stream Use I closure between March 1 to June 15, inclusive. The Contractor must not install plants when the ambient air temperature exceeds 90 degrees Fahrenheit, when the ground is frozen, has snow cover, or when wind speeds exceed 30 miles per hour.
3. Examination of Site: The Contractor must examine the Site and all conditions thereon and take into consideration all such conditions that may affect the work. The Contractor must notify the Engineering Consultant and Owner of any planting location which includes poorly drained soils, obstructions above or below ground, or other conditions that would not likely support plant growth over the expected life of the plants. If the Contractor believes that a plant will not survive in a location designated in the Contract (or Contract) Documents or as directed by the Engineering Consultant or Owner, the Contractor must notify the Engineering Consultant and Owner prior to start of work. Start of work indicates acceptance of conditions and full responsibility for work.
4. Plant Inspection: Plant inspection must be arranged by the Contractor at least one week prior to delivery. No plants may be delivered to the site until the required inspection arrangements have been made and the plant species, size and vendors are approved by the Engineering Consultant or Owner. All plants are subject to inspection by the Engineering Consultant or Owner for species/cultivar, size, and quality. Acceptance of plants during plant inspection does not preclude later rejection of plantings that do not meet these specifications - unless the Owner provides the Contractor notification in writing that specific deficiencies are being accepted.

5. Layout: The Contractor must provide stakes, and stake out approved plant locations before digging and installing plants, unless this requirement is waived by the Owner. The Engineering Consultant or Owner must approve the layout and the Engineering Consultant and/or Owner has the right to adjust the plant locations.
6. If requested by the Engineering Consultant or Owner, a sample for each plant variety must be planted as specified. Once approved by the Engineering Consultant or Owner, these samples must be tagged by the Contractor and used as standards of comparison for the remainder of the Work.
7. Trees must not be planted beneath power lines unless approval is provided by the Owner.
8. Trees, and shrubs where noted below, must be located outside the following minimum clearances. If any of these installation requirements conflicts with the Contract (or Contract) Documents, the Contractor must bring any conflicts to the attention of the Engineering Consultant and Owner prior to planting:
  - a. 5 feet from water line
  - b. 5 feet from gas line
  - c. 5 feet from inlet, outfall, or manhole
  - d. 10 feet from fire hydrant
  - e. 10 feet from sanitary sewer
  - f. 10 feet from another tree
  - g. 15 feet from light pole or light fixture
  - h. 15 feet from dam embankment (this also applies to shrubs)
  - i. 15 feet from a low flow orifice (this also applies to shrubs)
  - j. 20 feet from overhead utilities
  - k. 25 feet from principal spillway structures (this also applies to shrubs)

The Engineering Consultant or Owner will provide direction to resolve any clearance conflicts.

9. Delivery: The Contractor must notify the Engineering Consultant and Owner at least two business days prior to each delivery of plants to the Site. Plants must be sufficiently protected by tarp or other means during delivery. Plants must be protected from freezing temperatures, wind, and sunscald.
10. Planting area dimensions will be as specified in the Contract (or Contract) Documents, but at a minimum must be of a sufficient width to allow all void spaces to be completely filled when soil is placed back into the planting area. Plant rootballs of trees and shrubs must sit on undisturbed soil, rather than loosened soil.
11. Planting: The Contractor must carefully remove the plant from the container and avoid damage to the plant and its root system. For containerized plants, the soil and fine roots at the outside of the root ball should be slit in four places or lightly scarified. Burlap, wire cages, and twine must be removed from balled and burlapped plants. By carefully supporting the root mass, the plant must be placed in the properly sized planting area at a level so that the root collar is even with the surrounding soil. Up to 10% of the root ball may be above the surrounding grade. If the plant sits too low, soil must be placed back into the planting area and firmly compacted by hand to bring the base up to the correct level. The root flare of trees must be visible following installation.
12. Trees must be positioned so that the trunk is straight and plumb.

13. Backfill: The planting area must be backfilled with soil according to the Contract (or Contract) Documents or as approved by the Engineering Consultant or Owner. The Contractor must firmly pack soil around roots as soil is being placed. Grass clods, stones, and other foreign material are not permitted in the backfill.
14. Initial Watering: Watering must be provided the same day each plant is installed. The quantity of water used must be sufficient to settle the soil around the roots, fill air pockets, and saturate the root zone and adjacent soil. Initial watering must meet the requirements of Category 700, but will be incidental to planting.
15. Mulching: Each plant or planting bed must be mulched within 48 hours of planting, using double-shredded hardwood bark mulch placed at a depth of 2 to 3 inches. Mulch must meet the specifications for Subsection 920.04.03 of MSHA, but will be incidental to planting.
16. Tree and Shrub Protection: Wildlife protection must be placed around each tree/shrub the same day it is planted. All tree and shrub protection will be incidental to planting. Tree and Shrub Protection must be placed as follows:

Biodegradable Tree Shelter: Biodegradable hardwood slats woven together with natural roping to a height of 4 feet. Longer, stakes must be inserted a minimum of 24 inches into the ground to provide support, taking care not to damage root ball.

17. Normally, trees should not be staked. However, if the Contractor feels staking is necessary in order to meet the conditions of these specifications, the Contractor shall request approval for staking from the Engineering Consultant or Owner. If stakes are installed they will be considered incidental to the line item cost.
18. Tree Guying and Staking: When required or approved by the Engineering Consultant or Owner, the Contractor must install tree guying and staking according to the following:
  - a. Stake trees by installing 2 hardwood stakes 2 inches square by 6 feet long, driven into undisturbed soil beside, but not into, the root ball at a minimum of 15 inches from the trunk to a minimum depth of 2 feet below ground level.
  - b. Guy wires of galvanized steel of 10-gauge wire must be installed at the lower crotches of the tree crown.
  - c. Protective hose must be used where guy wires contact trees to prevent abrasion.
  - d. Bare wire must not touch tree stems or branches.
  - e. Any substitution for wire stays must be approved by the Engineering Consultant or Owner.
  - f. Guy wires shall be sufficiently loose to allow 4 to 5 inches of sway in the stem at the contact point of the plant material.
  - g. Guys and stakes must be removed prior to the end of the warranty period or within 7 days of request by the Engineering Consultant or Owner, whichever is sooner.

#### Installation Phase Maintenance and Watering:

1. All portions of the Site, which have been disturbed or damaged due to, or incidental to work performed must be repaired and restored to its original condition to the satisfaction of the Engineering Consultant or Owner.
2. The Contractor must protect all planting work until Initial Acceptance, and must repair and replace, at its expense, any work and plants damaged or missing during that period.
3. Installation Phase Maintenance: The Contractor must begin maintenance immediately after each plant is installed. The Contractor must inspect plants periodically during the installation

phase to ensure plants will meet Initial Acceptance requirements. Maintenance performed prior to Initial Acceptance is incidental to this specification and will be at no additional cost to the Owner. Maintenance items include the following, but may include additional items:

- a. Removal of weeds
  - b. Maintaining guys and stakes
  - c. Removal of plant tags (other than any aluminum tags included in this specification), ribbons, tape, or other attachments to the plants
  - d. Maintaining tree and shrub protection
4. Installation Phase Watering: The Contractor must water plants for 6 weeks following installation (even if this time period extends beyond the date of Initial Acceptance). If more than a ½ inch of rain falls in any week for which watering is scheduled, or if the soil is saturated, one or more watering events may be waived, but only upon written approval of the Engineering Consultant or Owner. Unless otherwise directed by the Engineering Consultant or Owner, during the 6 week period watering must be performed as follows:
- a. 3 times a week for the first 2 weeks
  - b. 2 times a week for the next 2 weeks
  - c. 1 time a week for the last 2 weeks
  - d. Watering must be sufficient to saturate root zone and adjacent soil.
  - e. For each tree, a minimum of 10 gallons of water per inch of caliper must be used.
  - f. For each shrub, a minimum of 2 gallons of water per foot of height must be used.
  - g. Installation Phase Watering must meet the requirements of Category 700, but will be incidental to planting unit costs and shall be at no additional cost to the Owner.
  - h. The Contractor must submit records to the Engineering Consultant and Owner within 7 days of each watering event, stating the dates watering was performed and the quantity in gallons of water used for each watering event.

#### INITIAL ACCEPTANCE:

Upon completion of all planting installation requirements, the Contractor shall request an inspection of plantings by the Engineering Consultant and Owner. If practicable, Initial Acceptance should take place at the time of Substantial Completion. However, if planting season timing does not allow Initial Acceptance at the time of Substantial Completion, or if it is projected that Substantial Completion will occur more than one month after completion of plantings, Initial Acceptance of plantings may occur at a different date than Substantial Completion.

Plantings may be inspected and accepted in phases if it is not possible for all plants to be installed in the same year and planting season. However, the Engineering Consultant or Owner must approve appropriate phases prior to the first Initial Acceptance inspection for phasing to be allowed.

#### Unacceptable Plants:

The following criteria will be used to determine if plantings are unacceptable. Any plantings that meet any of the following criteria will be rejected:

1. All Plants: Any dead or missing plant, any cause
2. All Plants: Any plant of the incorrect species, variety, or cultivated variety
3. All Plants: More than 25% of leaf area is dead, discolored, of an atypical shape, lost, browsed, or dropped.
4. Shrubs: More than 25% of the height or length has died back.

5. Trees: Unhealed wounds on the trunk.
6. Trees: More than 10% of the leader has died back.
7. Trees: More than 6 inches on 75% of branches have died back.

Initial Acceptance Requirements:

In order to meet Initial Acceptance, all of the following requirements must be met:

1. All submittals have been submitted and accepted
2. Layout has been inspected and approved
3. Planting pits and planting beds are weed free
4. Trees and shrubs are free of dead branches
5. Trees are installed vertically and straight
6. Wildlife protection is in place and in good repair
7. Staking and guying, if included, are in satisfactory condition
8. Washouts in planting pits and beds are repaired
9. Plants are watered
10. Shredded hardwood bark mulch meets specifications and is uniformly applied to the specified depth
11. Clean up is complete, plant tags (other than any aluminum tags included in these specifications) ribbons, tape, and other attachments to the plants are removed
12. Abandoned planting pits are filled and seeded or appropriately covered
13. Unacceptable plants have been replaced
14. Damage of repairs and punch list items are complete
15. Plants are properly installed

If an Initial Acceptance inspection reveals deficiencies, the Engineering Consultant or Owner will provide the Contractor with a punch list of any items that need to be corrected. The Contractor must make corrections, at no charge to the Owner, within 30 days of the inspection. Upon completion of all punch list items, the Contractor must request another inspection of the plantings to verify punch list items have been completed. If it is not possible to complete punch list items because the 30 day period occurs outside of the planting season, the Contractor must complete these within the first month of the next planting season.

### Certificate of Acceptance:

If an Initial Acceptance inspection reveals no deficiencies, the Owner will provide the Contractor with a Certificate of Initial Acceptance dated for the date of initial inspection or for the date punch list items were satisfactorily completed. This date shall be the start date of the Warranty. If Initial Acceptance is phased, the Certificate of Initial Acceptance will state the area/s for which acceptance is being given.

### WARRANTY:

1. The Contractor must provide a written establishment, maintenance, and replacement Warranty on all plantings.
2. The Warranty period shall begin upon the date of the Certificate of Initial Acceptance.
3. As necessary, the Contractor must perform work to meet Final Acceptance requirements at its sole cost.

The Warranty may be phased according to phasing of Initial Acceptance.

### WARRANTY PERIOD:

#### Deficient Plants:

During the Warranty period, the Contractor must identify plants that are deficient, defined as any tree or shrub meeting any of the following criteria:

1. All Plants: Any dead plant
2. All Plants: Any plant found to be the incorrect species, variety, or cultivated variety
3. All Plants: More than 25% of leaf area is dead, discolored, of an atypical shape, or dropped during the growing season
4. All Plants: Any plant damaged or removed by wildlife as a result of insufficient maintenance of wildlife protection
5. Shrubs: More than 25% of the height or length has died back
6. Trees: Has cankers, weeping wounds, or stains
7. Trees: More than 10% of the leader has died back
8. Trees: More than 6 inches on 75% of branches have died back

#### Replacement of Deficient Plants:

During the Warranty period, the Contractor must remove deficient plants from the site within 7 days following notification from the Engineering Consultant or Owner. The Contractor must keep a record of all plants removed. Any plants identified as deficient must be replaced within two months, or if outside of the planting season, within the first two months of the next planting season. These replacements are in addition to any replacements required by Final Inspection at the end of the Warranty period.

Unless otherwise approved by the Engineering Consultant or Owner, replacements must be of the same size, species, and cultivar as originally specified in the Contract (or Contract) Documents. Replacement plantings must meet all requirements under these specifications. Any areas disturbed by replanting shall be reseeded, resodded, or replanted with the correct plantings at no expense to the Owner.

#### Warranty Phase Monitoring and Maintenance:

The Contractor must perform monitoring/maintenance visits a minimum of once a month and maintain the plantings during the Warranty period as described below:

1. **Watering:** Following the 6 week watering schedule, the Contractor must monitor the plants for water needs, and water plants between April 15 and October 15 whenever less than 1 inch of rain has fallen at the site in any two week period, or if plant foliage is wilted or otherwise shows signs of needing water. Watering for trees must provide 10 gallons of water for every inch of caliper. For shrubs, provide 2 gallons of water for every foot of height. The Contractor must request approval from the Engineering Consultant and Owner prior to watering. The Engineering Consultant or Owner may also request watering. If requested, the Contractor must water plants within 72 hours of notification. Warranty phase watering must meet the requirements of Category 700.
2. **Weed Management:** Weeds must be removed from trees, shrubs, all mulched areas, wildlife protection, and tree staking and guying. Weed removal will be incidental to this specification section and at no additional cost to the Owner.
3. **Insects and Disease:** The Contractor must monitor the plants to determine if any insect or disease problems exist, and if so, which plants are affected.
4. **Epicormic Sprouts:** Prune epicormic sprouts from trees.
5. **Wildlife Protection and Tree Staking and Guying:** The Contractor must repair any tree and shrub protection and/or tree staking and guying that has been damaged or is out of place.
6. **Remulching:** The Contractor must replenish mulch once in the spring and once in the fall to bring the mulch back to a depth of 2 to 3 inches. Mulching must meet the specifications of Subsection 920.04.03 of MSHA, but is incidental to planting.
7. **Deficient Plants:** The Contractor must document plants that are deficient and notify the Engineering Consultant and Owner of the species and quantity of these in the monthly report. If requested by the Engineering Consultant or Owner, the Contractor must remove deficient plants within 7 days of notification. Any plants removed must be documented by the Contractor in the next report.
8. **Replacements:** Deficient plants must be replaced within two months of removal, or if outside of the planting season, within the first two months of the next planting season.
9. **Trash:** Problems with trash on the site must be noted in the monthly report.
10. **Monthly Report:** The Contractor must submit a report to the Engineering Consultant and Owner, on a monthly basis, documenting the above monitoring and maintenance activities.

## FINAL INSPECTION AND ACCEPTANCE:

The Contractor must request a Final Inspection by the Engineering Consultant and the Owner for Final Acceptance. The Final Inspection shall occur at the end of the Warranty period. Final Acceptance will be provided if all Final Acceptance requirements are met.

The Contractor shall replace all deficient plants and correct any other deficiencies discovered by the Final Inspection by November 15 following Final Inspection. All submittals and installation requirements in this specification section must be followed for replacement plantings. The Owner will provide written notice of Final Acceptance upon completion of work and correction of any deficiencies identified during Final Inspection. Final Acceptance will be granted when all the following requirements are completed:

1. Epicormic sprouts are manually pruned and removed
2. Tree trunks are straight
3. Staking and guying has been removed, unless requested otherwise
4. All plants are of the correct species, variety, and cultivar
5. All plants are alive and no plants are deficient
6. Tree and shrub protection is in place
7. Trees, shrubs, mulch area, and wildlife protection are free of weeds
8. Trees and shrubs are properly mulched

## PAYMENT:

Tree and Shrub Planting will be measured and paid for at the Contract unit price. Payment is full compensation for layout, marking, pruning, furnishing, installation, fertilizer, soil amendments, backfilling, staking, guying, edging, pest management, Warranty, watering and maintenance, including all materials, labor, equipment, tools, and incidentals necessary to deliver in accordance with the Contract (or Contract) Documents.

The Contractor will be paid 80% of the Unit Cost upon completion of tree and shrub installation including preparation, installation, and Initial Watering.

The Contractor will be paid the remaining 20% of the Unit Cost after Initial Acceptance and the City's receipt of the Contractor's written Warranty.

The cost of all Warranty and maintenance work is incidental to the Unit Price; the Contractor shall perform all Warranty and maintenance work at no additional cost. If the Contractor fails to perform any Warranty and/or maintenance work, the Owner has the right to perform the work and back-charge the Contractor.

## CATEGORY 800 – TRAFFIC (MSHA-BASED)

GENERAL NOTE: The referenced MSHA Sections and Subsections apply unless noted otherwise elsewhere in the Contract Documents. In case of conflict between MSHA specifications and other Contract Documents, the requirements of the other Contract Documents shall apply.

All work performed in the City Right of Way must be coordinated with, and inspected by, the City of Gaithersburg Public Works' Right-of-Way Inspector. Any defective work rejected by the Right-of-Way Inspector must be re-done at no additional cost to the City of Gaithersburg.

Unless otherwise described in each Line Item, in general, work performed under this Division is subject to inspection and acceptance by the Owner prior to payment. Any work not accepted must be re-done at no additional cost to the City.

### **SECTION 812 – FABRICATION AND INSTALLATION OF ALUMINUM SIGN**

#### **Line Item 45: FABRICATION AND INSTALLATION OF 4' X 8' ALUMINUM SIGN (LS)**

##### DESCRIPTION:

Comply with Subsections 812.01 and 813.01 of MSHA unless noted otherwise on Contract Documents.

##### MATERIALS:

Comply with Subsections 812.02 and 813.02 of MSHA unless noted otherwise on Contract Documents.

##### CONSTRUCTION:

Comply with Subsections 812.03 and 813.03 of MSHA unless noted otherwise on Contract Documents.

##### MEASUREMENT AND PAYMENT:

Fabrication and installation of 4' X 8' aluminum sign will not be measured but will be paid for at the Contract lump sum price. The payment will be full compensation for all excavation, backfill, drilled holes, and for all material, labor, equipment, tools and incidentals necessary to complete the work.